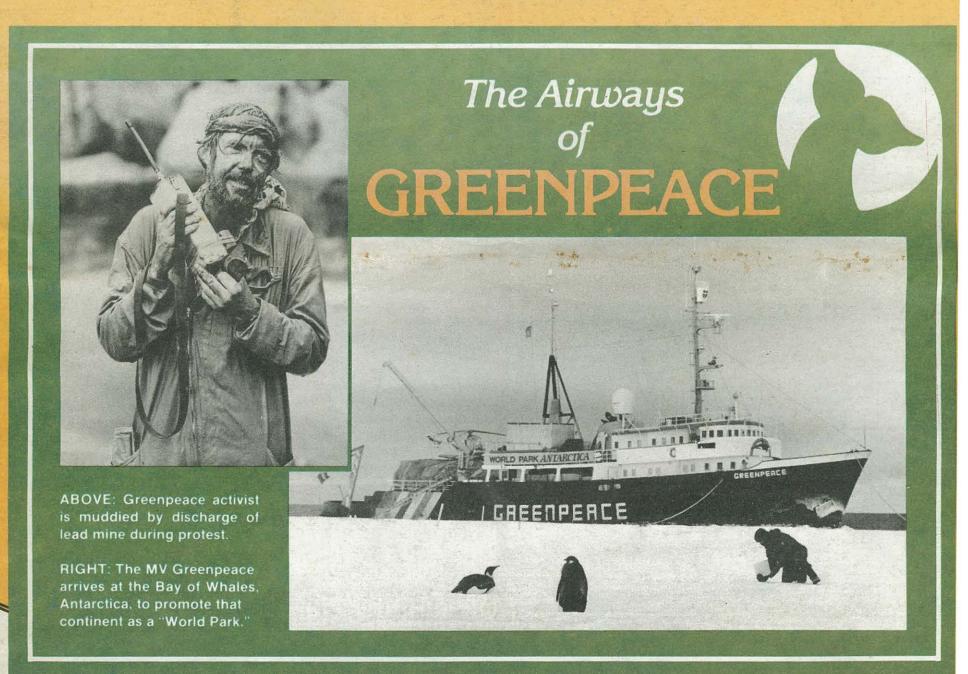
November, 1987 Volume 6, Number 11

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Inside This Issue:

- Magne Reviews the New Heathkit/Zenith SW-7800
- DXing the 'New Countries'
- Radio Beijing Turns 40!
- A Radio Buff's **Christmas Wish List**



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Terrorist Attack

Preparing for Possible



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From the Publisher:

On the Origin of Brasstown

A number of our readers have expressed interest in Brasstown, headquarters of *Monitoring Times* and Grove Enterprises, with questions ranging from, "How did it get its name?" to "Where the h--- is Brasstown?" to "Why in the world did you move there?".

The name is derived from the Cherokee Indian word "Itse-yi" ("new green place") and was confused in translation with another word, "Untasai-yi", which means "brass".

Brasstown is a quiet, rural farming community, high in the western Appalachian Mountains of North Carolina, sharing the Blue Ridge and Smokey Mountain ranges, and located in the Nantahala National Forest on the westernmost tip of the Tarheel State between Georgia and Tennessee.

Original settlers were mostly of British extraction, following the removal of the Cherokee Indians. Family names like Anderson, Brown, Byers, Caldwell, Cantrell, Carringer, Cook, Dyer, Green, Laney, Ledford, Payne, Rogers, Scroggs, Tipton, and Wilson monopolize the Brasstown section of the telephone directory (which isn't very big).

Local place names are particularly colorful: Brasstown is near Hanging Dog, Shooting Creek, Smackass Gap, Granny Squirrel, Chunky Gal, Greasy Creek, and a myriad others whose origins have been lost to obscurity.

Grove Enterprises and *Monitoring Times* are housed in a two-story frame building on Dog Branch Road (officially Jenkins' Branch, but not recognized as that since an old lady at the head of the street called it Dog Branch years ago because of the preponderance of canines on the road. Yes, they're still here and we have two collies!).

My wife, Judy, and son, Bill, and I moved here from Ft. Lauderdale, Florida, after tiring of neighbors' fighting, drugs, skyrocketing crime, artificial environments, blurring lifestyles, water shortages, and the burglary of our home.

Our home is on a quiet stream adjoining hundreds of acres of timberland with rolling hills and valleys. Our neighbors are unpretentious and kind. We can walk anywhere, anytime, without fear for our safety.

As I sit here composing this reflective piece, looking out my window at expanses of trees and grass, I fear for the future of places like this, an oasis in a desert of exploitation. Mountains and valleys are being shaved of their cover, built over with fast-food housing for other escapees by insensitive, opportunistic land developers.

In the meantime, I have found my Shangrila and have added years to a much happier life.

On the Cover: A penguin and the photographer observe each other during the Portman Bay Action; another Greenpeace activist reports in by radio after single-handedly plugging a mining operation waste pipe (Photos courtesy of Greenpeace). (Inset: The Christmas rush is on...and security is tightened at the malls in preparation for "Black Friday"--photo by Bob Kay, "Scanning" column editor)

Inside this Issue

The Airways of Greenpeace

Gutsy Greenpeace has made news all over the we for their environmental "actions." Extensive user the radio spectrum, you've got to be good to tun their exciting adventures. By Jock Elliott.

A Radio Buff's Christmas Wish List Christmas-In a twist on the spirit of the season, says that it's far more blessed to receive than to g

Interview:

Radio Beijing Turns Forty!

Radio Beijing recently celebrated its 40th anning sary. From its humble beginnings in a cave to the languages services of today, Radio Beijing is shortwave to stay.

When you see MT's wish list, you'll see why!

Here Come the New Countries

Think you've got the world of shortwave licked? I may -- for the moment. But things change fast in HF broadcasting world. Enrique Albaladejo locat future challenges.

Low Band Skip is Back!

Military exercises on the Nicaraguan bord Highway patrols from hundreds - even thousand of miles away. Low band skip is back and listening is good! Chuck Robertson tells you he

Time and Freq Standard Stations

This authoritative list provides a worldwide look one of the most reliable indications of propagati conditions.

Military Operations Areas

Are you getting buzzed by low-flying jets that seem come out of the blue? They don't; check this list find their home base.

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The Airways of



(Photos courtesy Greenpeace)

I t is an arresting scene: a young man, soaked in mining waste, contacts his fellow activists by radio after singlehandedly plugging a pipe draining into the Mediterranean. The image is arresting, but typical of an extraordinary organization called Greenpeace.

Greenpeace is a non-profit environmental and peace activist group that is dedicated to a couple of simple ideals:

- All species, including man, deserve protection.
- All species need a green and peaceful planet to enjoy.

Greenpeace activists believe these ideals can be achieved through nonviolent, direct confrontation. Equipped with nothing more than their own bodies, a two-way radio, and perhaps an inflatable boat, they bear witness and call the world's attention to the slaughter of animals; to the chemical poisoning of the earth, air, and water; and to the manufacture and testing of nuclear weapons.

Beginning with opposition to nuclear weapons testing on Amchita Island 15 years ago, Greenpeace has conducted actions around the globe. Some examples:

- Newfoundland, and Canada -- 1976 -- 1985--Greenpeace repeatedly confronts sealers in a effort to end this commercial slaughter.
- Lavallette, New Jersey -- 1985 -- Greenpeace activists plug the discharge pipe of a major industrial polluter; company officials are subsequently indicted by a grand jury.

GREENPEACE

by Jock Elliott

- Leningrad, USSR -- 1982 -- The Greenpeace ship Sirius enters Leningrad harbor to protest Soviet nuclear testing.
- Nevada -- 1986 -- Campaigners enter a bomb site and postpone a nuclear test.
- Spain -- 1979-1983 -- Activists confront nuclear waste dumping in the North Atlantic by the British vessel *Gem*.
- Vardo, Norway -- 1986 -- The Greenpeace vessel Moby Dick confronts illegal whalers.
- Rongelap, The Marshall Islands -- 1985 -- The *Rainbow Warrior* relocates victims of nuclear testing.
- Antarctica -- 1986 -- An expedition is launched to promote World War Park status and halt minerals exploitation.

In virtually, all of these actions, radio communications played a key role. Dick Dillman, N6VS, is the National Campaign Communications Coordinator for Greenpeace and a member of the Greenpeace Board of Directors. With operations in 17 countries and 6 ships on various bodies of water, there is a lot of activity to coordinate. Dillman joined Greenpeace in 1977. "I was a ham, and interested in Greenpeace activities, so I called to ask how they coordinate their radio communications. 'Our what?' they said. I knew right away they needed me."

One of Dillman's first projects was to set up communications in San Francisco for 1977 campaign to protest whaling. Greenpeace began using commercial maritime frequencies to communicate with the vessels *James Bay* and *Ohana Kai* that were confronting Russian whalers.

The Soviets, of course, were interested in disrupting Greenpeace operations as much as possible, and they hit upon an unusual and effective jamming technique.

"We were on the air when suddenly we were interrupted by this unearthly laughter. It was really pretty spooky," Dillman says. "The laughter was very broad spectrum and quite effective in messing us up. Later we concluded that it must have been a joke shop laugh box. To avoid the jamming, we invented code designations for different channels and skipped from one to another."

Later in the campaign, a situation occurred which was much more serious. Unknown to anyone, the fiberglass whip antenna on the *Ohana Kai's* commercial marine radio had developed a leak, and it filled with water. The next time the radio was keyed up, the finals in the transmitter literally blew up.

What followed reads like one of the corollories of Murphy's Law (if something can go wrong, it will, and it will happen at the worst possible time in the worst possible place). The steering gear on the *Ohana Kai* was locked, the gyro compass was out, and a storm was bearing down on her. It was a

very bad time to lose the main radio. Fortunately, the vessel was also equipped with a ham transceiver and antenna.

The problem was that Dillman did not have a ham transceiver at his communication headquarters in San Francisco. "I called a ham radio outlet nearby and asked if they had used transceivers for sale. The man on the phone said, 'No, but there's a guy here right now trying to sell me one.'

I said if he would drive to my place, I'd buy the radio. When he arrived, I threw some money at him, ran up the stairs, and got on the air with the *Ohana Kai*."

That ham transceiver served very well on a number of occasions, and Greenpeace still hs it, but is is rarely used anymore. That's because Greenpeace communications have shifted away from HF to satellite communications for ships at sea and UHF communications for land actions. Even though he loves working HF, Dillman moved communications to other frequencies in the interest of greater reliability.

"Most of the Greenpeace vessels are now equipped with INMARSAT earth (L-band) which enable voice messages, telex, and even still pictures to be sent back and forth as easily as using your home phone," Dillman says, "At first, I had to talk people into trying the satellites, but once they saw how well it worked, they were convinced."

For land-based operations, a stable of ICOM A-16 UHF handitalkies are the preferred means of communication. For example, recently Greenpeace activists climbed the outside of the State Capital in Albany, New York, and hung a banner from the building to protest the pollution of the Niagara river. To support that action, Dillman supplied handitalkies and arranged for the use of a local commercial repeater to aid communications.

Greenpeace also has its own repeater for times when others are not available. If you hear of a Greenpeace action in your area, fire up your scanner in the UHF frequencies and start hunting. You just might be able to hear them in action.

For diehard HF DX enthusiasts, there is still one regular target left: Greenpeace's antarctic base maintains regular RTTY (SITOR) communications with New Zealand on the 8 MHz commercial marine frequencies. Dillman thinks that anyone who can copy their Antarctic base is a superb DXer.

A fundraising ad on the back of the Greenpeace quarterly magazine sums up Greenpeace operations. It says:

"For one dollar, this woman will dodge harpoons, defy men with clubs, and dive into toxic waste."

It's not only good advertising copy; it's true. And when a Greenpeace activist bears witness to activities that threaten life on earth, chances are she will have a radio in her hand.

EXTRA! EXTRA! READ ALL ABOUT IT!

GREENPEACE INVADES RUSSIA!

The information below is a copy of the traffic from the Rainbow Warrior during the Greenpeace "invasion" of the USSR, which occurred on July 18, 1983. It is in the form of telexes which Dillman relayed to the various Greenpeace offices around the world. The transcript begins the day before the invasion and ends on July 23, the day the Russians returned our people.

Radio conditions during the action were abysmal. No commercial stations could be contacted on HF from the Bering Seas. As a result, all traffic was therefore send via Morse code on the 14 MC/S amateur band. The operator aboard the ship was Lloyd Anderson/N6BMI. Dick Dillman, N6VS, was the shore operator. The captain of the RainbowWarrior was Peter Willcox.

RAIMBOW WARRIOR WAS CONTACTED AT 0900PDT 7/17. POSITION AT THE TIME OF CONTACT WAS NOME. A ZODIAC WAS DUMPED IN THE SURF AND DEPARTURE HAS BEEN DELAYED BY RECOVERY EFFORTS. THERE WERE NO INJURIES. -DILLMAN-

VANCOUVER GP
THE GREENPEACE BOAT RAINBOW WARRIOR DEPARTED NOME, ALASKA AT SAM JULY 17PDT. THE
ESTIMATED RUNNING TIME TO SOVIET TERRITORIAL WATERS IS 15 HOURS. AT A MEETING PRIOR
TO DEPARTURE, THE CREW REAFFIRMED THEIR INTENTIONS OF ENTERING SOVIET TERRITORIAL
SPACE IN ORDER TO DEMONSTRATE OPPOSITION TO THE USSR'S OBJECTION TO THE 1986 IWC
PHASE OUT OF ALL COMMERCIAL WHALING. THE STORM WHICH HAS BEEN HITTING THE AREA, THE
SOVIET UNION AND ALASKA FOR THE LAST SEVERAL DAYS HAS PARTIALLY ABATED, CREW MORALE
IS HIGH AND EVERYONE IS FULLY PREPARED FOR WHATEVER MAY HAPPEN WHEN THE BOAT REACHES ITS DESTINATION.

THE NEXT SCHEDULED CONTACT WITH RAINBOW WARRIOR IS 2200PDT 7/17. CUMMINGS

CVCR, USA, INT)
RAINBOW WARRIOR WAS CONTACTED AT 0830PDT 7/18. RADIO OFFICER ANDERSON ADVISED THAT
THEY WERE OFF THE WHALING STATION AT LORENG, SIBERIA, AND THAT SIX GREENPEACERS HAVE
BEEN ARRESTED BY SOVIET AUTHORITIES AFTER GOING ASHORE AT THE STATION. THEY ARE IN
CONTACT WITH THE COMMANDER OF THE STATION BUT THERE HAS BEEN AN ADVISORY ON THE
DISPOSITION OF OUR PERSONNEL. IT WAS OBSERVED THAT THE STATION IS SET UP TO RAISE
FUR BEARING ANIMALS AS WELL AS PROCESS WHALES. PRIORTY

CONTINUOUS RADIO WATCH IS BEING MAINTAINED FOR FURTHER TRANSMISIONS. ANY NEW FORMATION WILL BE FORWARDED IMMEDIATELY. -DILLMAN-

THE GREENPEACE PERSONNEL SEIZED ON SHORE AT LORENG ARE PAT HERON, NANCY FOOTE, BARBARA HIGGINS, DAVID REINHEART, CHRIS COOK AND RON PRECIOUS. THE RAINBOW WARRIOR WILL REHAIN ON SCENE UNTIL THE SITUATION WITH THOSE ASHORE IS RESOLVED. -DILLMAN-

PRIORTY

(VCR,USA,INT)

RAIMBOW WARRIOR WAS CONTACTED AT 101BPDT 7/18. RADIO OFFICER ANDERSON ADVISED THAT OUR PEOPLE WERE SEEN BEING TAKEN AWAY BY THE SOVIET HILITARY. THE RAIMBOW WARRIOR THEN BEGAN TO DEPART THE AREA. THEY WERE HARRASSED BY A SOVIET HELICOPTER WHICH THEN BEGAN TO DEPART THE AREA. THEY WERE HARRASSED BY A SOVIET HELICOPTER WHICH FIRED TWO GREEN FLARES ACROSS THEIR BOW AND DROPPED A NOTE ORDERING THEN TO STOP FIRED TWO GREEN FLARES ACROSS THEIR BOW AND DROPPED A NOTE ORDERING THEN TO STOP IMMEDIATELY AND RETURN TO THE WHALING STATION AS SOON AS THE FILM DROP OFF FILM. THEY HOPE TO RETURN TO THE WHALING STATION AS SOON AS THE FILM DROP OFF IS COMPLETED. POSITION AT TIME OF CONTACT WAS STATION AS THE FILM DROP OFF IS COMPLETED.

65N 171W. -DILLMAN-

PRIORTY

RAINBOW WARRIOR WAS CONTACTED AT 1120PDT 7/18. THE FOLLOWING TRAFFIC WAS COPIED AT THE TIMES INDICATED.

(1121) VESSEL IN INTERCEPT COURSE ETA 10 MINUTES. NO IDENTIFICATION YET, WE ARE STILL INSIDE 12 MILE LIMIT.

(1130) WE HAVE 2 MINUTES TO GO TO THE 12 MILE LIMIT. HELICOPTER APPEARS TO HAVE SPOTTED ZODIAC.

(1144) APPROACHING VESSEL LAYING OFF R/W 3 HILES HAS LAUNCHED 2 SPEED BOATS AND HELICOPTERS IN PURSUIT OF 20DIAC. WE ARE NOW OUTSIDE OF 12 HILE LIHIT. PLEASE STANDBY FOR NEXT EXCITING INSTALLMENT.

(1200) ATTEMPTING ZODIAC LOCATION/RECOVERY IN HEAVY PATCHY FOG. HELICOPTER ASSMENT CONTINUES.

A CONTINUOUS RADIO WATCH IS BEING MAINTAINED. A CLANDESTINE TRANSHITTER HAS BEEN INSTALLED ABOARD R/W FOR COMMUNICATION IN THE EVENT OF SEIZURE. ANY NEW INFORMATION WILL BE IMMEDIATELY FORWARDED. -DILLMAN-

PRIORTY

(VCR, USA, INT)

RAIMBOW WARRIOR WAS CONTACTED AT 1234PDT 7/18. POSITION AT TIME OF CONTACT WAS
65.05N 170.43W. RADIO OFFICER ANDERSON ADVISED THAT BEFORE THE FOG CLOSED IN THEY
65.05N 170.43W. RADIO OFFICER HOVERING OVER THE ZODIAC CONTAINING JIM HENRY AND THE FILM.
SAW A SOVIET HELICOPTER HOVERING OVER THE ZODIAC CONTAINING JIM HENRY AND THE FILM.
WHEN THE FOG CLEARED, THEY SAW HENRY BEING PICKED UP FROM THE WATER BY THE
HELICOPTER. THE ZODIAC WITH THE FILM STILL ABOARD WAS RECOVERED BY THE RAINBOW
WARRIOR. HONOR'S CONDITION IS UNKNOWN. AT THE TIME OF CONTACT THERE WAS ONE SHIP
ONE NILE OFF THE BOW AND TWO SHIPS SEVEN HILES ASTERN OF THE RAINBOW WARRIOR. THEY
ARE PROCEEDING TO NOME. ETA WILL BE PROVIDED WHEN AVAILABLE.

AT 1931PDT LLOYD ADVISED THAT A RUSSIAN WARSHIP DEMANDED BY RADIO THAT THEY STOP IMMEDIATELY. RAINBOW WARRIOR ADVISED THAT THEY WERE UNABLE TO STOP AT THIS TIME. WHEN ASKED WHAT THEIR INTENTIONS WERE, LLOYD REPLIED "NOHE (61c) UNLESS FIRED UPON." STAY TUNED -DILLMAN-



(VCR, USA, INT)

.

CONTINUOUS CONTACT HAS BEEN MAINTAINED WITH RAINBOW WARRIOR SINCE THE LAST REPORT. THE FOLLOWING EVENTS HAVE OCCURRED SINCE THEM. THE TIME REFERENCES IN PARENTHESES ARE IN PDT FOR 7/18. STATEMENTS ARE THOSE OF RADIO OFFICER ANDERSON TRANSMITTED IN NORSE CODE. - DILLNAN-

(1340) CLOSEST PURSUIT VESSEL, A MERCHANT VESEL, IS 500 YARDS ASTERN AND HAS ANNOUNCED IT WILL ATTEMPT TO STOP US.

(1954) ENGAGED IN VERY CLOSE NAMEUVERING WITH MERCHANT SHIP NOW.

(1358) VERY VERY CLOSE MANEUVERING NOW. GETTING QUITE HAIRY. THEY'RE PLAYING

(1410) LAST PASS WAS LESS THAN 20 FEET AWAY GOING FULL TILT. PETER'S BOAT HANDLING IS BRILLIANT.

(1415) PETER REQUESTS US COAST GUARD BE ADVISED OF OUR SITUATION WITH RUSSIANS AND PROVIDE AIR COVER IF POSSIBLE. (THIS REQUEST WAS RELAYED TO COAST GUARD AND TURNED DOWN.) -DILLHAN-

(1440) BUZZED BY HELICOPTER AGAIN. WARSHIP IS CLOSING. MERCHANT VESSEL IS

(1507) RUSSIAN WARSHIP ONE HILE ASTERN HAS ANNOUNCED INTENTION TO STOP US AND PLACE PERSONNEL ABOARD. RUSSIANS ACKNOWLEDGE WE ARE IN INTERNATIONAL WATERS. PETER ADVISED THEN WE WON'T STOP.

(1525) CINDY THE MEDICAL TECHNICIAN ADVISES THAT BRUCE HAS A BROKEN LEG AND WILL REQUIRE MEDICAL EVAC.

(1600) WARSHIP HAS TURNED AWAY. WE WILL BRING BRUCE TO NOME FOR TREATMENT. PLEASE ADVISE COAST GUARD.

CVCR,USA,INT)

A CALL WAS RECEIVED FROM RAINBOW VIA THE NOME MARINE OPERATOR AT 0030PDT 7/19. THE ETA NOME IS 0300PDT 7/19. LOUIS BARRETO WILL HAND CARRY THE FILM TO SEATTLE ON THE FIRST AVAILABLE FLIGHT. A LOT OF GOOD ACTION FOOTAGE WAS SHOT INCLUDING BRUCE'S SWAN DIVE FROM THE R/W INTO THE ZODIAC THAT JIM HENRY WAS IN, WHICH WAS CIRCLING UNDER POWER. THIS HEROIC EFFORT WAS THE CAUSE OF BRUCE'S BROKEN LEG. LLOYD ONCE AGAIN DESCRIBED PETER'S HANDLING OF THE BOAT DURING THE CHASE AS BRILLIANT AND UNBELIEVABLE. NO DECISION HAS BEEN MADE ON THE NEXT PHASE OF THE CAMPAIGN BUT THEY DO NOT PLAN TO IMMEDIATELY RETURN TO RUSSIAN WATERS. -DILLMAN-

(VCR, USA, INT)

(VCR,USA,INT)

CONTINUOUS CONTACT HAS BEEN MAINTAINED WITH THE RAINBOW WARRIOR SINCE THE LAST

REPORT. AT 2342PDT THE RUSSIAN VESSELS WERE SIGHTED AND AT 0015PDT 7/23 A 20DIAC

WITH DAN AND RICK DAWSON CAME ALONGSIDE THE RUSSIAN VESSEL WITH OUR PEOPLE ABOARD.

CHRIS COOK REPORTED TO HAVE SAID "THEY'RE NICE. THERE'S NO REASON FOR US TO BE

UPTIGHT." THE RUSSIANS ASKED THE GREENPEACERS IN THE 20DIAC TO RETURN TO THE RAINBOW

WARRIOR FOR MR. RASNUSEN, THE MAYOR OF MOME, SO THE HE COULD PARTICIPATE IN THE

TRANSFER ABOARD THE RUSSIAN VESSEL. AT THIS TIME (0125PDT) THE TRANSFER HAS NOT

OCCURRED. WORD OF THE TRANSFER WILL BE TRANSMITTED IMMEDIATELY. -DILLMAN-

AT 0129PDT WORD WAS RECEIVED THAT OUR PERSONNEL WERE BEGINNING TO COME OFF THE RUSSIAN VESSEL. STAY TUNED. -DILLMAN-

(VCR.USA.INT) HUZZAHITITI

AT 0200PDT 7/23, RADIO OFFICER ANDERSON ADVISED THAT ALL OUR FRIENDS WERE SAFELY BACK ABOARD THE RAIMBOW WARRIOR! LLOYD ALSO ADVISES THAT MOST OF OUR GEAR APPEARS TO HAVE BEEN RETURNED. FURTHER DETAILS WILL HAVE TO WAIT UNTIL THE MEDIA COMPLETE THEIR FRENZY OF CALLS FROM THE BOAT. THE NEXT SCHEDULED CONTACT WITH THE BOAT BY GREENPEACE RADIO WILL BE BETWEEN 2100PDT AND 2300PDT 77/23. THIS WAS GREAT! LET'S DO IT AGAIN SOON! -DILLHAN-

BEST REGARDS, DICK DILLMAN/M6VS

1311 EST

NGHCONP HGH

A radio buff's pristmas

I have to admit to feeling a little strange about writing a letter to you, Santa. After all, I'm thirty-two years old, have a wife and two kids, a mortgage, car payments, and more bills than the paycheck comes near to paying.

Maybe that's why I'm writing, Santa. You see, I'm desperate. I'm hooked. Yes, St. Nick, T'm ready to admit that I'm a radio addict. I listen to radios. I write about radios. I mean, I'm in love with radio.

I found out about the depth of my illness a couple of weeks ago when my wife, Soni, asked me to turn off the radio and say good night to the kids. Honest to God, Santa, that was a surprise. I didn't know I had kids! But who can blame me for a little oversight like that?

You see, I've been pretty busy over the past six years, chasing down Radio San Miguel, Bolivia on 3320.4. Boy, has that been a tough one. Let me tell you. Radio San Miguel is a 500 watter from Riberalta that broadcast in Spanish from 2200 UTC fade-in until 0200 sign off and again from 1000 UTC until 1645 fade out. I hear it's also on occasionally from 0230 until 0300 but I haven't... Santa? Santa! Wake up!

OK. Maybe you're right, Santa: Maybe I should get into something beside shortwave listening for a while. Maybe a change would be good.

Wait. I've got an idea! You know, Gordon West has a 21 day course for getting my novice ham license. It has code tapes, a 112 page book, band chart, FCC forms, sample tests and a hotline for student questions. It's just \$19.95 plus \$2.50 postage and handling from Gordon West Radio School, 2414 College Drive Dept MT, Costa Mesa, California 92626 [714]549-5000. And guess what, Santa! It comes with \$70.00 in equipment certificates from manufacturers like ICOM, Kenwood, and Yaesu.

Speaking of ICOM, it sure would be nice to find one of their R71A general coverage receivers under the tree! The R71A is recognized around the world as a quality receiver with superior performance. It's versatile, includes 100 db dynamic range, adjustable noise blanker, selectable AGC, and dial or keyboard frequency selection. Man, there's nothing you can't hear with one of these babies. This is top drawer stuff. And its suggested retail price is just \$949.00 -- a mere pittance for a man of your means, if you get my drift, Santa. Several Monitoring Times advertisers carry it.

And if you're up to it, perhaps you might even consider tossing in a Seeker from AF Systems. The Seeker, in case you haven't heard, is a complete system for controlling the R71A/E with your Commodore C-64, C-64C or C-128 computer. One of its seven modes allows you to schedule the unattended recording of up to one hundred transmissions -- all you have to do is select the day, start and end time, reception mode, a description, and up to four frequencies to test for the best signal. Other modes give you access to literally hundreds of other

frequencies.

The complete system, including sample frequencies, broadcast schedules, hardware, software, and all cables is only \$219.00 plus shipping and handling. But MT readers like yourself can clip this out and purchase the system for a discount. If you'd like -- and I'm just suggesting, Santa -- you might want to write for more information to AF Systems, P.O. Box 9145-X, Waukegan, Illinois, 60079-9145 [312]623-

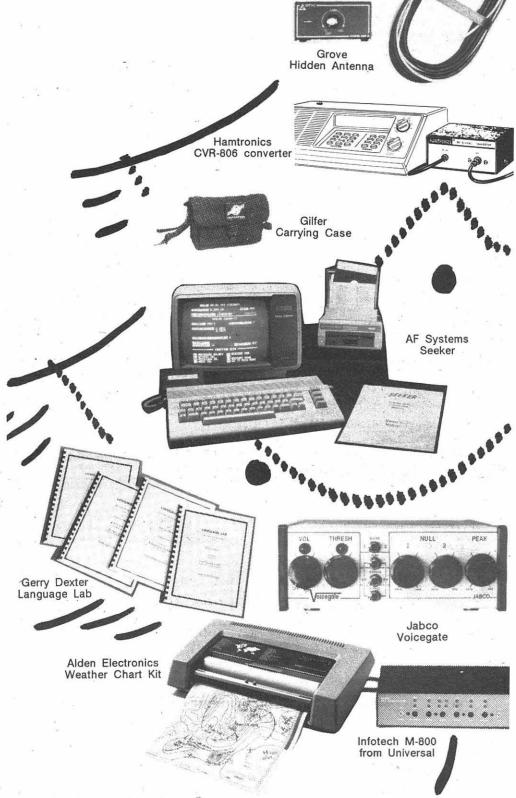
As you probably know, Santa, a receiver is only as good as the antenna you attach to it. What? You say that you didn't know that? Oh, yeah. It's true. That's why I'd also like a Grove Flexible Indoor

Few products in the Grove catalogue have captured so much attention as this hidden antenna system. It's designed for apartment dwellers or anyone who can't put up an outside antenna. And after my tower fell down last year and crushed Mr. Hayworth's new Porsche, you can easily imagine why the hidden antenna appeals to me.

It's available in various configurations for scanners, shortwave receivers, or both. It can make the different between marginal reception and "armchair" copy! And the basic system is only \$50.00! Just a suggestion, St. Nick -- write to Grove Enterprises at Box 98 Dept MT, Brasstown, North Carolina, 28902 [704]837-9200.

Another suggestion might be an MFJ-1024 outdoor active antenna! It's a two-piece 54" whip that eliminates outside long wire antennas and actually outperforms longwires hundreds of feet long.

It covers everything from 50 kHz to 30 MHz -- just the place I like to hang out -- and all frequencies from VLF through lower VHF, long wave, medium wave, broadcast and shortwave bands. It comes



complete with a 50 foot coax cable and can be put up in no time at all! It's just \$129.95 plus shipping from P.O. Box 494 Dept MT, Mississippi State, MS 39762 [800]647-1800.

Of course, pulling in all that signal is bound to increase the noise as well. JABCO's new Voicegate would do just the trick with an audio gated squelch, two independent tunable notch filters, one tunable bandpass filter, an audio amplifier and a dynamic audio expansion system. It'll even automatically activate and de-activate my cassette recorder for times when I'm not home--great for you on Christmas eve,

The Voicegate comes with connectors and patch cord; all I'd need is 18 Vac @ 500 ma and an 8 ohm speaker (which you could also pick up at Jabco). A free brochure is available for an SASE, or a 30-minute demo cassette for \$3.50 (credited toward purchase), or you can just pick it up for \$109.95 from Jabco Electronics, R.1 Box 386 Dept MT, Alexandria, IN 46001.

And now that we've put together a pretty nifty receiving package, let's tack on a little pizazz. Alden Electronics has a professional quality facsimile Weather Chart kit for hobbyists like me. It's an easyto-assemble kit that, when connected to a stable receiver like the R71A



and suitable antenna, can receive weather charts, satellife pictures and oceanographic data from over 50 transmitter sites around the world. Now wouldn't that be a kick! And it's only \$1,000.00!

You can get more details by sending a letter from the North Pole to Alden Electronics, Dept MT, Washington Street, Westborough, MA 01581 [617]366-8851.

Over at Universal, Fred Osterman's got a pretty neat gizmo called the INFOTECH M-800. Fred says that once you've got one of these, you can actually "see" the world. You can receive and print pictures using your shortwave radio. See FAX weather maps, press photos, marine information, military charts, satellite photos and more! Write to him at 1280 Aida Drive, Dept MT, Reynoldsburg, Ohio 43068 [614]866-4267 for more information. Fred says you'll really like it.

I've got some other great gift ideas too. Why not take a look at the -- what? You say you've got to be going? Your sleigh is due over Southeast Asia in an hour? Well, what's the problem? If you had the new Azimuth WT-80 World Time, 24 hour clock, you wouldn't have to worry about time. I mean really, Santa. You're going to get an ulcer, or something.

world. Set London for GMT/Universal time push the switch and the local time in 24 other cities around the world on a sharp, LEL display. Long life AAA batteries are included and if you order now you can save \$10.00! It's just \$19.95 plus \$1.95 shipping and handli from Azimuth Clock, 11030 Santa Monica Blvd, Suite 100-A Dept 1 Los Angeles, CA 90025 [213]473-1332 (Call collect for a credit card Accessories! Now there's another great idea! Radios without th

The Azimuth clock displays local time plus 24 cities/zones ar

knowledge to make the best of it is equipment wasted, that's what always say. I mean, suppose that you did bring me the ICOM R71A It'd sure be nice if I got a DX Edge. Lemme tell you how it works

Turns out that DXers have known for years that their chance getting those hard to hear stations is when their location is in sunse and the location of the station is in sunrise. Or vice versa. It's calle "greyline" DXing.

But calculating just when this occurs has never been easy -- ur now. With the DX Edge, you can find the perfect time to try for an station at any time of the year. DX Edge puts this information at y fingertips in an easy-to-use 11 inch plastic slide rule device. You car get it from Imprime for just \$19.95 plus \$1.95 UPS shipping from P.O. Box 241 Dept MT, Radnor Station, Radnor, PA 19087 [800]32. 1776 ext.126 -- Limited quantities, so hurry, Santa.

And how about a Hamtronics CVR-806 converter? Boy, that would be nice! If you don't want to spring for one of those new general-coverage receivers, I could still tune in those new 800 MHz land mobile frequencies (only the legal ones, of course!). A converte for my scanner would do just the trick, and you can get one from Hamtronics, 65-K Moul Road, Dept MT, Hilton, NY 14468-9535

A couple of good books might also round things out nicely. He about a copy of Tom Kneitel's new 6th edition "Top Secret" Registry U.S. Government Radio Frequencies. It's now 192 pages, and covers everything -- I'm talking about 120,000 listings -- from 25 to 470 Ml There's FBI, DEA, CIA, NSA, Customs, Secret Service, Border Patr Immigration, ATF, Santa's cordless phone frequencies (just kidding, Santa!), ATF, Treasury, Marshals. Federal Prisons, National Forests

It's just \$17.95 plus \$2.00 for mailing from CRB Research, A56 Dept MT, Commack, NY 11725. And rumor has it that if you mention MT, you'll get a special list of several hundred "action" frequencies.

The Midwest Federal Frequency Directory (MFFD) might also be nice idea. It is an 80 page directory organized in three ways: by frequency, by call letters, and by major agencies. And it provides coverage of federal radio operations in seven states -- Illinois, Indiar Kentucky, Michigan, Ohio, Pennsylvania, and West Virginia. It is pac with up-to-date information, including some stuff never published before! You can pick up a copy of MFFD for \$8.00 from Scan America, 430 Garner Drive, Suffield, OH 44260.

I hear, too, that QSL collectors are improving their totals with the four editions of Language Lab. It's the foreign language reportin guide by Gerry L. Dexter. They're available in English to Spanish English to Portuguese, English to French and English to Indonesian. Each has over 800 sentences, phrases and key words to let even the dumbest among us look like Charles Berlitz. Each is \$12.95 plus \$1.(shipping from P.O. Box 493 Dept MT, Lake Geneva, Wisconsin 5314

Phew! Now suppose, just suppose -- and I certainly don't want appear greedy or anything -- you were to bring me all of the things my list. Well, I'm going to need something to carry them around in. After all, my good man, you can't expect me to be seen walking around the street with a furry red sack of radios slung over my back

So why don't you get me one of those nice carrying cases from Gilfer Shortwave? I can take my portable radio and accessories along with me in one of these waterproof wonders. A small one is o \$29.95; the large size just \$32.95 plus \$4.00 shipping. That's from Gil Box 239M, Park Ridge, New Jersey, 07656 [201]391-7887. Well, Santa. I guess that's it. I hope I've not been too greedy of

anything. After all, I have been a very good boy this past year!

Be sure to mention Monitoring Times' Christmas Wish List when you order and support your MT advertisers!

The Voice of China:

Radio Beijing Turns Forty!

by Li Li

"I regard the voice of Radio Beijing as the voice of the Chinese people, as it offers us a chance to learn about this strange nation." This is an excerpt from a letter written by Manfred Steinauer, an Austrian listener to Radio Beijing. The occasion was a special program called "Radio Beijing and Me," which celebrated the 40th anniversary of the station back on September 11.

Radio Beijing and Me

"Radio Beijing and Me" was first aired in March of this year and has drawn some 40,000 letters from more than 40 countries. Each sings the praises of Radio Beijing's 38 language services, warmly expressing their friendly feelings for the Chinese people and the station. At the same time, they express their congratulations on the 40th anniversary of the station's founding.

The founding of Radio Beijing took place at 20:40 on the evening of September 11, 1947. It was then that the Xinhau Broadcasting Station in northern China's Taihang Mountains launched its English program. Located in a cave, it transmitted over a renovated transmitter taken from a captured Kuomintang aircraft. With only a few hundred watts of power, few heard the short, 20 minute broadcasts. The situation did not change until 1949, when New China was born and the external broadcasting station moved to the capital, Beijing.

Growth of External Broadcasts

The Chinese government attached great importance to shortwave broadcasting from the start. In terms of capital investment destined for broadcasting during the First Five Year Plan (1953-1957), 50 percent went to external broadcasting compared with 30 percent for stations in the various provinces, municipalities, and autonomous regions and 20 percent to the central broadcasting station.

In 1959, China built two powerful transmitters -- then considered to be first class units -- and began broadcasting to the whole world. Air time was extended to 40 hours a day, using 16 languages and a staff of 300. By 1965, the station was receiving some 286,000 letters a year.

Boredom and the Cultural Revolution

Growth in the audience for Beijing's External Broadcasting ground to a halt during China's chaotic "cultural (1966-1976). revolution" Radio Beijing became a parody of propaganda. Programs were dry and news items long and crammed with political jargon. Feature programs were few and far between. And although the programs were broadcast in 38 different languages, the station averaged only 20,000 letters a year during this time -- a drop of some 260,000 pieces compared to '65.

After ten years of the cultural revolution, major changes came to China -- and to Radio Beijing's programs. According to Beijing Review, the "fine traditions of seeking truth from facts was restored and boring preaching made way for rich feature programs." Closer contacts were maintained with the audience. In the first half of this year, the station received more than 75,000 letters.

Aerial Bridge

Radio Beijing is the only external broadcasting service in China. The presentation of news and information about the country is objective and authentic -- designed to foster audience understanding and improved relations between listeners and the Chinese people.

In order to give a detailed, overall impression of China which goes beyond mere news and commentary, Radio Beijing has added regular feature programs in various languages. In the English department, the number has doubled to twenty, and includes "Economic Horizons," "Culture in China," "The



Happy Birthday, Radio Beijing!

Cooking Show," and "Learn to Speak Chinese."

The Japanese department has seven special programs on music alone. Others include "Friendship Saloon" (Italian), "Kaleidoscope" (Romanian), "Women and Children" (Urdu), and "China in the Eyes of the Turkish People" (Turkish). All language departments have their own listeners' letterbox programs.

These programs show the real China to the audience. For foreign listeners, the Chinese external broadcast services are an "aerial bridge" linking China with the rest of the world.

Voice of China

Apart from accurately presenting

China to the world, Radio Beijing also offers timely reports on major international events and represents the official view of the Chinese government on world Although the cold-war rhetoric of the 1960s is gone, it continues to take a firm stance on some issues, "hegemony" most notably attacking in 1983 the "hegemonic stand" in withdrawing from the United Nations Educational, Scientific, and Cultural Organization (UNESCO).

That report, says Beijing Review, "was welcomed by many listeners." The station proudly quotes a letter from a Tanzanian listener who said, "There are only a few countries which dare to openly denounce the rule of hegemonic powers. China is one of the ..."



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But China can also put on a caring face. In 1985, when Africa was hit by a prolonged period of drought, Radio Beijing recorded its own version of the west's "We are the World," calling it "Stretch Our Hands of Help to the African People." Radio Beijing followed the broadcast of the recording with reports of many touching stories of generosity and concern by the Chinese people -- medical workers attending patients free of charge; artists selling their paintings to donations, martial arts troupes giving benefit performances, and monks praying collectively for the African famine victims.

Response to Listeners

In another story, Radio Beijing relates how a 23 year old disabled Moroccan girl named Medekor Amina wrote to the station in despair. She was worried and pessi-

mistic about her future. Having listened to Radio Beijing's Arabic programs however, she had come to know something of China and wrote to the station. In her letter she requested information about the manufacture and embroidery of Chinese clothes so that she might learn a new way to make a living.

The staff of the Arabic department responded immediately, telling her about Zhang Haidi, a disabled Chinese girl who had overcome her handicaps. They also mailed her three dress making books in Arabic.

The staff of Radio Beijing estimates that, over the past 40 years, they have received more than 2.8 million letters from listeners. Virtually all, say the Chinese with no small amount of pride, were "answered either with detailed explanations, frank expressions of opinion or warm-hearted greetings."

From its post-war beginnings in a cave, through severa Five Year Plans and the Cultural Revolution to today's modern China, Radio Beijing has always been the voic of its times and its people.

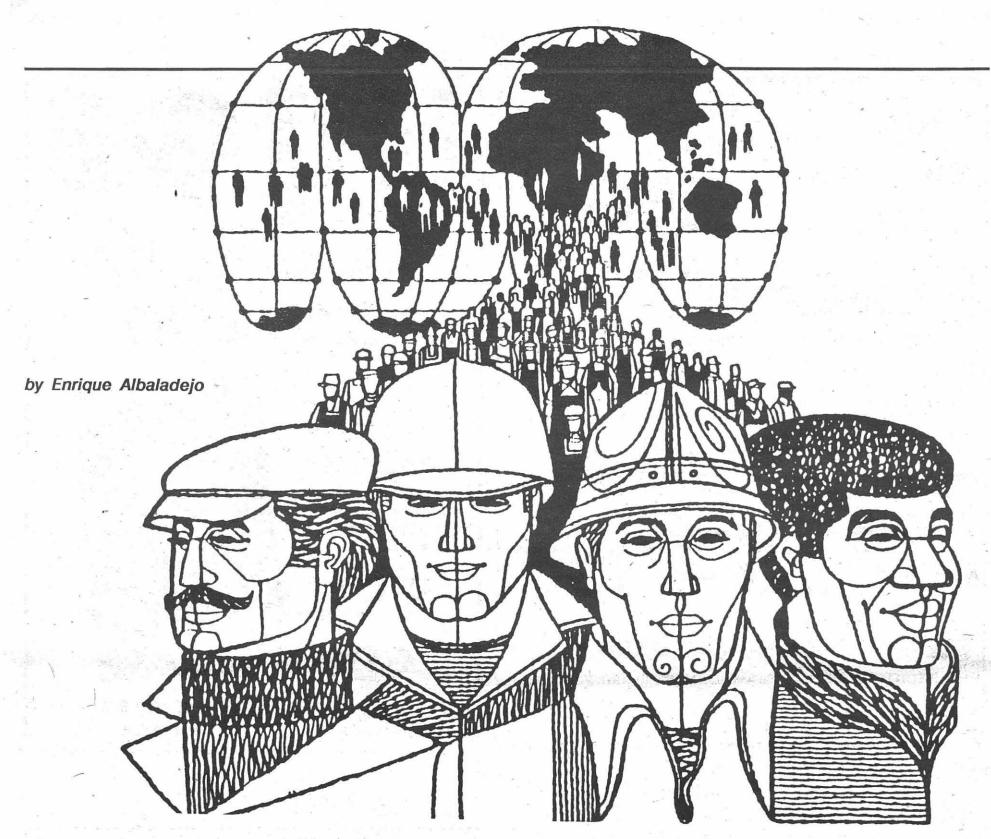
Official's Comments

Liu Xiliang, a 1950s graduate of the Spanish Department of the Beijing Foreign Languages Institute is Radio Beijing's acting director. Described as "alert and efficient," Liu concentrates his efforts on the station's future development.

Getting the Signal Out

Liu sees Radio Beijing's biggest weakness as its limited transmission capability. And, as listeners on North America's east coast well know, it is difficult to hear the station. The government plans, however, remedy the situation by building larger transmitting station although the government admits the it will be some time before the project is completed. In the meatime, the station is adopting a serific of remedial measures, such as swaping transmitter time with oth stations (an agreement with the Swiss gets under way the first of the month) and buying time on other

In all, it's apparent that Chin believes in shortwave. It is all apparent from its mammoth effort that it desperately wants the world believe them.



Here Come the New Countries

We DX'ers have a "country" fixation. The process of logging or confirming a new one represents the best in DX doings, especially when your pockets are already bulging with nations you've nabbed. Then the pickings are few; when finding a new country is about as rare as spotting a condor in New York City.

To those whose logs contain but 50 or 75 countries, the supply of new worlds yet to conquer may seem well nigh inexhaustible. It seems as if there's enough to last a lifetime, and then some. But if you stick with the hunt seriously you won't be the first DX'er to wake up one day to-

discover there's very little left in the way of new countries to log. And DX'ers who reach that stage of the game and who focused most or all of their attentions only on logging new countries, have been known to lose all interest in DX'ing once they've run out of places to chase.

Fortunately, we can rarely log them all. There are always a couple like Tristan da Cunha (*Passport to World Band Radio* lists Tristan's schedule as Sunday's from 1000-1200, Monday through Friday from 1600-1700, and Monday, Wednesday and Friday from 1945 to 2200 UTC on 3290 kHz!) which seem forever out of reach.

But even if it were possible to log all of the countries on whatever country list you go by, you could never completely rest on your laurels. New countries keep showing up --which, of course, is all to the good. As DX'ers we find ourselves almost always in the challenging situation where someone new has come on the air within the past six months and/or with one or more promised to us down the road.

Sometimes - about once every half a generation - we are totally astonished to find a new country suddenly appear on shortwave, the station not having seen fit to advise the zillions of DX'ers in its potential audience that it had such plans. The most recent such instance was WSZO in the Marshall Islands which had all of DX-dom dancing with delight when it suddenly appeared on the air last spring.

There was also a recent case in which people were hearing a station in a new country and didn't even know it! Radio Mediun's transmitter at Nador, Morocco, was later discovered to be inside an area which used to be Spanish Morocco.

If you go by the country list of the North American Shortwave Association then presto - you had a new country without even trying for it. Like a bug under a rock, it was there but unnoticed.

Country hunters can take heart. The next few years may very well see quite a parade of new countries taking up shortwave broadcasting activity.

Some of these places aren't really countries, of course. Not by any political definition you can name. But they are or are likely to be considered as "radio countries" by one or more of the scoring systems (read "country lists") currently available. So, as was noted just above, there's quite a bit of activity and and potential activity promised, rumored or in actual fact coming up or down the calendar. Here's a preview:

Aruba - One of the so-called "A-Bislands in the Netherlands Antilles, Aruba is in the process of breaking away and going out on its own. So it seems likely that country counters will be able to split it off into separate status on any list as well. The medium wave religious broadcaster on the island, Radio Victoria, has been given a 100 kilowatt shortwave transmitter by the Far East Broadcasting Company. It thus seems quite certain that Aruba may be one of the first in this new crop of radio countries to come on the air. With 100 kW from its Caribbean location it's also likely to be quite an easy station to log.

Curacao - If Radio Earth is ever able to put into practice its plans to eliminate the middlemen and go on the air with its own transmitter from here, then all three of the islands will be on shortwave (Bonaire is the old timer with the Radio Netherlands relay as well as Trans World Radio). The key word is "if". And, "if" not, then the project has, at the least, got the government thinking in terms of shortwave broadcasting, and that might have paved the way for someone else, who knows?

Puerto Rico - The island that could one day be our 51st state is definitely destined for the higher frequencies. And with Indeed, the island may sink into the Caribbean under the weight of all the 500 kilowatt transmitters the Voice of America plans to put on the air. We can't answer when as we have not seen a VOA timetable but don't

be surprised if it isn't. Either way, when these fellas do get on, you'll

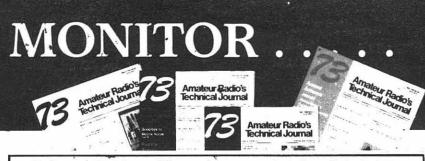
Grenada - There are many DX'ers out there who can show you a QSL card from the Windward Islands Broadcasting Service from back when that's what the station there was called. There are some who can show you QSL's from Radio Free Grenada, though in that guise the station was much less free with its cards. The U.S. sion/rescue put an end to all broadcasting by Radio Grenada, though it has long since returned to medium wave and FM. Shortwave? The manager says he'd like to do that in a couple of years, after current operations are fully organized, consolidated and running smoothly. Certainly there are no promises. Certainly letters of encouragement would help.

Tonga - Pacific area broadcasting was in the doldrums for more than 20 years. We lost the Gilbert and Ellice Islands. We lost Fiji and nearly New Zealand. And there wasn't much there to begin with! Now things are turning around and seem close even to surpassing the activity levels of the good old days.

A religious broadcaster in New Zealand - Radio Rhema - has been given the go ahead by the Kingdom of Tonga to build an AM-FMshortwave station and this should be on the air sometime during 1988. It will probably operate in the 60 and/or 49 meter bands and should be nicely positioned, challenge-wise. No snap but far from impossible.

Micronesia - The Federated States of Micronesia announced plans for a shortwave broadcasting facility a year or more ago but there's been no further word on development.

Brunei - The Sultan could afford \$10 million in change to provide aid to the Nicaraguan contras, yet his shortwave broadcast station went off the air a number of years ago. Now there are reports that Brunei's broadcasts will be resumed, with new and more powerful transmitters. Again, we have no time frame, no idea of when this might happen. When Radio Brunei was active it operated in the 41 and 60 meter



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Goa - Back when the Portuguese held sway over this little enclave on India's western coast Emissor da Goa was an active shortwave broadcaster. When the Indians moved in and took over they put the transmitter off the air and Goa left the list of active shortwave countries. On paper, at least, the Indian government has seemingly endless projects aimed at extending the reach of All India Radio. One such involves placing a shortwave transmitter in the area which was once Goa. The announcement was made some 18 months ago and there's been no further word.

Andaman Islands - Out in the Indian Ocean, these islands belong to India but are much closer to Burma than India. The distance factor may be a telling one when it comes to these islands "making it" as a radio country. New Delhi has announced plans for a ten kilowatt shortwave transmitter here, in order to improve AIR's coverage of the islands.

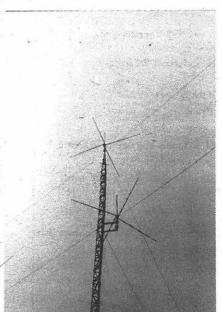
Reunion - Also in the Ind Ocean, Reunion is another "o was" - a formerly active shortw broadcasting country. Just recei Radio France Internatio announced plans to build a re station on Reunion so the isla should return to the ranks of active, albeit as host to a relay rat than programming of its own.

So that is an even ten new count which we may be hearing on bands over the next few years. E if they don't all make it the chan seem pretty good on at least sev And there's always the DX eternal optimism to keep us going between. Maybe Bahrain decide not to be the odd man out the gulf anymore and start bro casting on shortwave. Perhaps other newly merging Pacific nation will want an effective means reaching citizens living on far flu dots. What about Andorra, B muda, Martinique, Panama, Tri dad, Jamaica? Would the BBC I a high power shortwave in Scotla do you think?

Low Band Skip is Back!

by Chuck Robertson

29.805,



One source of low band skip commonly heard is RFI rebroadcast over Conservation channels -- a rusty TV tower? a spliced guy wire? perhaps a heterodyne signal? --Whatever, it renders the channel useless when the skip comes in.



Propagation

The ionosphere is important to radio monitors because it can refract back to earth radio waves which hit it. As a result, these signals -- called skywave -can often be heard considerable distances from the originating trans-mitter. Ultraviolet light is the "gas" of skywave signals. Insufficient UV and they just don't make the long hop.

The level of ionization depends on solar activity. And solar activity is dependent on the time of day, season of the year, your listening location, and the level of sunspot activity, which occurs in a series of 11 year cycles. Fortunately, solar cycle 22 has entered with a roar.

What will you hear?

In the so-called low bands (30-50 MHz), the airwaves will be filled with sounds of Spanish two-way communications from America and Canada. Listeners will be able to hear Latin American military operations; listeners on the east coast transmissions from the California Highway Patrol (CHiPS). Other state highway patrols and police agencies will be similarly affected. US Army exercises from proving grounds and ranges will also be audible and signals traveling 2 to 3 thousand miles and more -- when things get really hot -will occur on an almost daily basis.

Already, things are heating up, as evidenced from these entries into the log book. All military catches are wide-band FM (WBFM). All civilian catches are narrowband FM (NBFM). Exceptions are noted. 29.80, 29.95, 31.30, 32.02, 32.40, 36.00, 36.19, 38.00,

42.00 MHz Soviet Military, Time Domain (TD) Scrambling and Clear

The Russians are in Cuba. Russian language communications are logged regularly at my QTH in southern Illinois. The channels listed above are usually off frequency a few kHz. Most times it's impossible to clearly hear both sides of the conversation without slight retuning.

The Year at a Glance

I'll leave you with a few propagation tips. Look for E_s skip any time of the day or night on frequencies across the 30 to 50MHz band. Skip distances vary from 500Mhz. Search the 30MHz portion of the band first, then scan upwards to find how high the MUH is. Skip distances are over 2000 miles, with multi-hop extending the range. During periods of low to moderate solar activity, afternoon hours seem to be best for F2 catches.

November and December should see many band openings. January is the quietest month of the year for VHF skip; however, if a major solar flare should occur in this month, look for intercontinental openings to Europe and Asia with skip distances over 9000 miles!

February and March are fantastic -- I receive some of my best foreign skip during this period. April is a pivotal month gradually tapering off in May, June, July, and August. Late August, September, and October are a mixed bag with infrequent band openings. That's it! Now get out there and DX!

Low Band Skip Loggings

29.850 Whistlers, radiotelephones (Mexico?) US Military mobile, base and telemetry; low power.
Spanish, two males "Guatemala"; "Vamos!" NBFM.
"Straight Jacket Control, Straight Jacket Mobile", US Military, 29.90 29.995 30.00 NBFM; stockade operations? "Chemical Base", US Military. 30.00 30.00, "Tiger Base" US Military. North Carolina military personnel heard informing a Canadian 36.55 30.10

mobile phone user he was on a US military frequency! 30.15, 30.35, 30.80, 31,00 Time domain scrambling and clear voice; Spanish military, Central America. Afternoon hours are the best time to hunt for skip from

Central and South America and the Caribbean. 30.475 Security Service (Guatemala?)

30.96, 31.00, 31.04

New York City taxi services (Spanish language)
30.15, 31.35, 32.05, 32.35, 32.40, 34.40, 34.80, 36.05, 37.00
ASCII-type data burst (preamble) followed by digital scrambling. The scrambling sounds like a distorted guard tone. This is one of the loudest forms of scrambling I've ever heard! Military personnel say

they are "going digital" before switching on the scramblers. I suspect that this may be "KY"-type US military scrambling.

Repeater. Los Alamos Proving Grounds, New Mexico, NBFM; Base 30.15

is "3600" and security personnel use numbers like "3603." Other IDs include "Noble Roman," "Coronado Field" (Albuquerque) and "Cundiyo and Dulce" (towns near Los Alamos). Star Wars technology is developed in Los Alamos.

US military "Bad Man 3" 30.20

30.20/30/40 Semiduplex, US Military. Voice multiplexing (MUX)

Multiplexing is a wideband technique utilizing sub-bands on either side of the carrier frequency -- something like the SCA systems that accompany FM broadcast stations. Since the signals are not directly on the carrier frequency, they sound like single sideband. Use of a BFO will not clarify the signal.

The frequencies 30.20 and 30.40 were used semi-duplex. There were also tones on 30.31, 30.35 and 30.39.

30.00, 32.20 Aircraft, Ft. Campbell, KY. "Screaming Eagle" 30.20, 32.15, 36.05, 42.00, 48.75

DES scrambling, US Government. DES is composed of a short high-pitched data burst (preamble) followed by what sounds like static. The "static" is the digitized audio arranged a near-random

pattern. 30.25

US Mil Aircraft 30.40 "Windjammer Control," "Windjammer Mobile" (US military)

30.50,

31.10 "Silo 5"; apparently missile silos.

30.55

"Control del Campo" Spanish military.
Intermittent tones; this is a developmental frequency, used for testing 30.565 new radio techniques or equipment. Location seems to be the East Coast (Statustronics, Farmingdale, NY?)

Nonstop signaling (tone varies from high to low pitch every two 30.58

seconds). Heard along with Canadian paging stations. 30.60

30.60

30.75

"Skyking" aircraft and ground stations (US military)
"Birdman to Faithful" (US military)
"Charlie Uno" (Spanish military, Central America)
Bus service, New York City, Amplitude Modulation (AM)! Spanish 30.76 with English accent.

30.80, 31.10, 31.50, 31.60, 31.80, 32.00 & 33.10

WBFM West German military (Bundeswehr) mock battles with tankto-tank (panzer) and tank-to-helicopter combat in a desert location.

A European reader states that the West Germans have a base at Pueblo, Colorado. Here are some of the tactical call signs and ID's:

		Rock Rim name of war games operation Magpie tactical
		Smilie tactical Panzer Charlie Tank C Hierleitung Range Control
31.10	* * * * * * * * * * * * * * * * * * *	New York Transit Authority (buses); base and vehicles use Amplitude Modulation (AM)! NBFM channels include: 31.02,31.06,-31.08,31.12 and 31.14 Rptr-out, 30.90Rptr-in.
31.23 31.35	22/	New York taxi service (bootlegged frequency), Spanish language. "Red Leg Operations" US Mil.
31.35,	3268	Raging, Argentina.
31.38		Time domain scrambling: I suspect Canadian fishing vessel operating on a bootlegged frequency and located on Canada's east coast and waterways.
31.40 31.75	7	Louisiana truck drivers; "Gonna' stop and get some snake oil." US Corp of Engineers, Panama: this is a very active channel during
		the F2 skip season! Aircraft, mobiles and bases heard conducting maintenance on the Panama Canal and its reservoirs include: "Guabala Air" (tower); "Ft. Sherman" (Panama); Go Go Solo (town near Panama Canal); "LSE Site" (work site); "Rio Indio" (Madden Lake area); "Army 292" (helicopter); "Ft Gulick" (Panama); "Station 99", Corps site".
31.48	_	Panama Canal communications. The Gulf Fleet Marine Corporation vessels give regular reports to Harvey, Louisiana!
31.84	Base	, 31.85 Mobile US business on east coast: "Colonial Chevrolet"
31.94		Canadian fishing vessels on bootlegged frequency; speech inversion scrambling.
32.00		Honduran Military, Spanish language, "Campo Palmerola" (Palmerola AFB, Honduras); "Pito Solo".
32.05		"Ram Base," "Ram Control," "Ram 89" (US military)
32.16		(repeater) Schools and schoolbuses in the Monotick, Warkworth, Merricjville area, Ontario, Canada NBFM
32.20		US military vehicle, Texas
32.37 32.40		US government, NBFM "Unit K" Keep your eye on this one! "Desk Top Control," "Desk Top Remote" (US Military)
32.55		Time domain scrambling; no clear voice heard, but it was obviously
32.65		Spanish language. "Yoda", "Lone Star", "Joshua" US Mil; sounds like Star Wars!
33.00		Ft. Knox, Kentucky.
33.00 33.10	1	New York taxi service on bootlegged frequency in Spanish. "Iron Flint Operations". US Navy
33.14		Several US businesses have been repeated over this high powered Canadian repeater.
33.20,	33.55	,38.45 "Gulf 6, Gulf 7", US Navy
33.35		Recurring tone. Possibly a data line on standby with tone signal constantly coming up every second just to reassure the circuit that it is operational.
33.45	F	Canadian mobile telephone, full-duplex.
34.00		Time domain scrambling (Spanish military)
34.30	-	Dutch military, English language; Base is probably on the east coast. Can anyone identify and locate this operation?
34.45		Radio frequency interference (RFI). So what makes this noise of interest? Well, it seems year after year the signal is rebroadcast over the US National Conservation repeaters on 34.83 out, 34.43 in! My
		local National Wildlife Refuge virtually gives up using their radios when this grinding skip comes in. The RFI signal slowly drifts in frequency and will not access the repeaters if too far from the input, 34.43MHz.
		Here are some of the conservation stations using repeaters on 34.83 out, 34.43 in.
1	# # #	KIE617 Orsino, Fl KIE645 Savana, GA KIE641 Cambridge, MD KIE639 Harrisburg, PA KIE638 Richmond, VA
34.55	×	"Hovermaster", hovercraft. Probably US military.
34.55		US Mil. convoy near Dunn, NC.
34.65 34.80		Flight evaluation tests, US military. "Farley liaison", "Impact area"; aircraft and range control, US military.
34.85		Paging;, NBFM, "Atlanta". Possibly Department of Human and Health Services, Atlanta, GA.

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34.90,	
34.99	ASCII tone bursts lasting about one second.
35.00	New York City taxi (bootlegged frequency), Spanish lang
33.00	Check 32.00 and 34.98 for more NYC taxis.
25.00	
35.00	"Wilcox Radio; Heath Radio; Eagle Base; Security Center", US
	tary; maybe Arizona.
35.00	US military, Panama, possibly Medevac operations for Army Cor
	Engineers.
35.04	Canadian fishing vessels on bootlegged frequency. East Coas
35.85	US military mobile unit at training center
40.01, 40.0	
	0.31, 40.33
	Bureau of Indian Affairs communications between schools and t
	on the Indian reservations in New Mexico and Arizona. Here
	few callsigns her over the repeaters:
	Shiprock, KOJ566
	Toadlena, KOP552
	Alamo, KOP528
	Tuba City, KOJ567
	Ft Defiance, KOJ570
4U.4U	reienietry, regularly neard,
40.48	Four digit numbers read by a professional announcer, NBFM.
	numbers contained fractions (i.e., 48401/2)
40.59	Paging, NBFM (US Govt)
40.95	Continuous data flow
41.00	Aircraft near Albany, NY.
41.10	(repeater) US business and paging skip is occasionally rebroad
.1.10	over this Spanish repeater.
41.35	(repeater) Security, Department of Human and Health Serv
41.55	Atlanta, Ga. NBFM
41 EE	
41.55	"Gulf Fleet 1"; US Navy
41.95	Kirtland AFB, Albuquerque, NM. Tower and aircraft.
42.50	"VCX516" Ontario Humane Society, Thunder Bay.
43.65	(repeater) Colon Fire Dept., Colon, Panama. This repeater so
= 8	times rebroadcasts US business skip (NBFM) and US military
	(WBFM!) The repeater is NBFM.
45.44	Time domain scrambling, Spanish military. Cuba (and pos
	Nicaragua)
46.90	(repeater) US business skip is rebroadcast over this Spanish repe
49.15	Radiotelephone, Spanish
49.35	Canadian business, "Cherry Creek"
49.40,	California Capitalon, Charly Crook
49.725	Radiotelephone, full-duplex Spanish
49.76	Canada Hydro line operations, "Hightower"
49.80	Radiotelephone, British West Indies (probably Bahamas), full-duj
	NBFM.

November is a time when, in many parts of the U.S., winter truly comes upon us. That same wind that long ago whipped the leaves from the trees now drives most of us inside and closer to the radio.

At about the same time, in places far, far away, broadcasters seem to go absolutely mad. In the engineering departments of stations all over the globe, a creeping, insidious disease, takes hold of their minds. The disease: **frequency roulette**. First the times change in Europe. Then a few frequencies. Then the U.S. time changes. Then more frequency changes. At about this time, everyone thinks that someone else is on the frequency they've chosen so everyone changes again. And again. And again. And by the time everyone in this audio demolition derby settles down, it's time to change frequencies for the spring.

This exercise invariably leaves listeners dazed and confused. It's no wonder shortwave listeners are so dedicated. They have to be!

A Once-in-a-lifetime Catch! Anyone who had their radio on during mid-October probably noticed the absence of regular programs from Kol Israel. The reason, it turns out, is that workers for the Israeli Broadcasting Authority (IBA) went on strike.

Anyone lucky enough to be tuned to Kol Israel's usual 13750 frequency during this time found something very special. Instead of strike-related filler programming, they found a once-in-a-lifetime DX catch -- Galei Zahal, the Israeli Defense Forces station.

Galei Zahal is a special Hebrew language station for the armed forces. It broadcasts over AM and FM in Israel and is the second of only two organizations allowed to broadcast under Israeli law. (The first being the Israeli Broadcasting Authority [IBA].)

Galei Zahal is known to have a few shortwave transmitters of their own but these units are almost never used and are only, at least report, some 50 to 100 watts in the 2 and 3 MHz region. They are probably simple field packs and have never been heard in the United States. Inside sources say that they are not even audible in Israel -- on the rare occurrences when they are used.

In a reportedly rare instance of cooperation between the two organizations, Galei Zahal apparently received permission to broadcast over the IBA transmitters. The result is the signal now being heard.

It might be worth mentioning that Galei Zahal usually picks up the Reshet Bet (B) home service for seven minutes or so of news at the top of the hour, but naturally, you won't hear that during the strike as it comes from the IBA.

Ironically, due to the strike, the fact is that aside from newspapers, the only source of decent news in Hebrew currently available to the public in Israel comes from Jordanian TV!

How long will Galei Zahal be audible? The answer is unknown. Could be until the strike is settled, and no one knows when that will occur. any case, I hope it's still on by the time you read this! Good luck!

We've got some more DX news for you and we'll turn the stage over to Kannon Shanmugam, who'll be filling in for me for a couple of months.

Introducing Kannon Shanmugam - Kannon Shanmugam is one of shortwave's rising new stars. He's a great DXer who really knows how to make a radio stand up and sing. Here's some information he's compiled to help you get the most out of your time behind the dials.

Belgium: Here's the schedule for Belgische Radio en Televisie, BRT, in Brussels. These English transmissions can be heard through March 5, 1988. All schedules in this section are set up by time, followed by schedule (S=Sunday, M=Monday, T=Tuesday, W=Wednesday, H=Thursday, F=Friday, A=Saturday; no code indicates daily), frequency and, where available, target area.

0300-0055	5910, 9925	[Americas]
0800-0825 M-F	5910, 17600	[Australiasia]
1000-1025 M-F	5510, 17610	[Africa]
1330-1355 M-A	5590, 17600	[North America, S.E. Asia]
1630-1655 M-A	5510, 17610	[Africa]
1830-1855	6035, 9860	[Europe]
2200-2225	5910, 6035	[Europe, North America]

Burma: The new Burmese Army Station is now using new 6570 kHz at 1030-1330. Sarath Weerakoon speculates that the transmitter may be a new 10 kilowatt model. In any case, it has been logged by a number of U.S. DXers, including *Monitoring Times*' own loggings editor, Gayle Van Horn.

Canada: The other shoe has dropped in the Canada-Japan transmitter swap. Radio Japan has been rebroadcasting its programs over Radio Canada's facility in Sackville for some time; now Canada will get the use of Japan's facilities. And although this would seem to mean that Canada could at last satisfy its lust for reaching the Pacific region, a report from Canada says the languages will be (one hour in) Russian, and (half hours each in) English, French, Japanese and Ukrainian. Two frequencies will be used and the first programs hit the airwaves at the first of the year.

Costa Rica: As reported in the last issue of Monitoring Times, Radio for Peace, TIRFP, has been noted by various sources on 7380 kHz, between 0000 and 0300 UTC.

Radio Lira International is planning a second transmitter. They now use 15460 kHz with 5 kilowatts of power. (WOR)

Dominican Republic: Radio Discovery continues to have problems with the erratic power supply in Santo Domingo and has been off the air recently. But the biggest reason for the absence of the station is that it is now in the process of moving into the government radio and TV building, from where it will relay the programs of Radio Television Dominicana on shortwave from 0900-0500 UTC on 15045.

In addition, you can now hear the Radio Discovery program, "This is Santo Domingo" in English at 2000 and 0000 UTC and its Spanish counterpart, "Estoy es Santo Domingo" at 1900 and 2300 UTC. Look for the voice of Jeff White, now in Santo Domingo overseeing the transfer of the facility and an increase in power.

Ecuador: A slight change in HCJB's evening schedule to North America: at 0035-0070, the old 9870 kHz has been replaced by 9875 kHz.

Finland: Trouble continues with Radio Finland's new transmitter site at Pori. In an effort to straighten this out a bit, they've added extra frequencies and dropped secondary targets. Here is their new, revamped and renovated schedule:

```
6120* 11715, 11755 [Europe and North America]
6120, 9560, 11755 [Europe]
6120* 15245, 15305 [Europe]
0430-0455
0630-0655
0700-0725
                   6120* 15245, 15305 [Europe, Australia, East Asia]
0830-0855
            M-F 11945, 15400 [North America]
1100-1125
            M-A11945, 15400 [North America]
1200-1225
1300-1325 M-A11945, 15400 [North America]
1300=1429
                  15185, 15309 [Moddle East, Africa]
                   6120* 9610* 11755* [Europe]
6120* 15305, 15400 [Europe, South America]
1830-1855
2100-2125
                    * = omni directional beam.
```

So, how are Radio Finland broadcasts being heard at your place? Radio Finland would like to know. Call them. It's toll free. 1-800-221-9539. (SCDX)

France: Radio France International continues its incredible commitment to shortwave. Further expansion of their facilities is planned. They should have a new relay station on the air from somewhere in South Asia by next year -- Thailand seems to be the frontrunner here. Also, a relay at Reunion is schedule to light up by 1990 with two 500 kilwatt transmitters. The service area for the site will be the Middle East and East Africa.

Meanwhile, RFI is now on the air 24 hours a day in French and broadcasts in an additional 12 languages. English is at 0200, 0330, 0415, 1110, and 1600 UTC. Try also for their bilingual (French and English) DJ program from 0300-0500 UTC for eastern North America.

Gabon: Swiss Radio International has changed the frequency of its relay via Africa Number One in Gabon. 11920 kHz is now used for the program at 2210 UTC. The non-English transmission is beamed to South America. (WOR)

Grenada: Richard D'Angelo of Pennsylvania reports having received a letter from Radio Free Grenada saying that the station should be back on shortwave within the next two years. RFG left the airwaves during the American invasion and formerly occupied the frequency now used by Radio Discovery -- 15045 kHz. Look for Jeff White, Radio Discovery's owner, to conduct his own invasion of Grenada if they try to reclaim their frequency. (with WOR)

Hong Kong: Here you go, QSL hounds! Here's the schedule for the BBC's new Hong Kong relay station:

0400-0815	11775, 15280	1500-1615	5995, 7160
0815-0900	7180, 11775	2245-2330	5965, 15435
0900-0945	5995, 7180	2330-0030	11820, 15435
1300-1445	5995 7160		

India: All India Radio's new external service transmitter site at Bangalore is almost completed. The facility will reportedly run 500 kw. (RNMN)

Italy: RAI's Arabic service broadcasts from transmitters on Sicily each day (except Sundays) from 1330-1345 and 1430-1445 on 6060 and 9515 kHz. If the programs in Arabic are as awful as the ones in English, we could see peace in the Middle East very shortly -- the programs will put everyone to asleep. (with RCI)

Jamaica: The Jamaican Government has dissolved the Jamaican Broadcasting Corporation (JBC) and public radio will soon be underway -- in more ways than one. Shares of stock in the new venture, it seems, will be sold to the general public. The change also opens the possibility of having shortwave from the island as well, although the idea remains in the realm of speculation at this time. (with WOR)

Lebanon: The Voice of Lebanon is on the air 24 hours a day on 6550 kHz. News in English airs art 0900, 1315, and 1815 UTC. This is a very, very tough one to hear -- near impossible. (WBI)

Lesotho: The BBC has installed a new 100 kw transmitter at its Lesotho relay site. Listen for testing to begin way down on 3340 kHz from 1500 to 2130 UTV. (RNMN)

Madagascar: Radio Madagaskara is audible at 1930-2100 on 3288 kHz. The frequency is variable, wandering as far away as 3287.6. Look also on 4960 kHz from 1430 to 1600, with a switch to 2495 kHz in the middle of the broadcast. (RCI)

Netherlands Antilles: Aruba will soon be on shortwave. Yes, it's another new country. And yes, Don Jensen predicated it in the last issue of Monitoring Times! Look for an FEBC-donated 100 kw transmitter named Radio Victoria to sign on with religious and cultural programs.

KGEI will soon begin to broadcast to Southern Europe and Africa in English.

Nicaragua: Whatever happened to Sandinista shortwave? It's a question that all of America has been asking. The answer is, they've been busy getting a new transmitter on the air. And now, you, too, can hear the Voice of Nicaragua on new 6100 kHz from 0000-0700 UTC with one hour English broadcasts at 0000, 0300, and 0600 UTC. The domestic service, in Spanish, is on 6105 kHz, along with occasional English. (WBI)

Nigeria: Nigeria. Land of turmoil and poverty. A long time ago we ran an article entitled, "Nigerian shortwave stations. Catch Them Before they're Gone." Well, a lot are off the air -- four on the 49 meter band and one on 41 meters. However, there are a few left and you might want to try and hear them: Look for regionals from Kaduna (4770 and 6090), Ibadan (6050), and Enugu (6025). (RNMN)

Papua New Guinea: Broadcasts in Pidgin English are quite an experience -- a mixture of strange terms, interesting accents, and, well, it just sounds great. Get a taste of this strange language by tuning in Radio East Sepik at 1050 or so UTC. The frequency is 3335 kHz and you'll hear not only Pidgin but island vocals and even a splash of American pop music. (with Wayne Thomas, ASWLC)

Seychelles: FEBA radio can be heard in Farsi -- the language thos people are yelling in the background during those on-the-spot reports from Iran. The time is 0300-0330 UTC and the frequency is 11869 kHz. There's also an English-language "DX Postbag" program at 073. UTC. (RCI)

Suriñam: Just in time for lunch time listening at the office! Pull the tuna salad sandwich out of the desk, push back your chair, kick off your shoes and punch up 17755 kHz. And enjoy. You're listening to the sounds of Radio Surinam International, broadcasting in English of Thursdays via Brasilian transmitters, from 1730-1755 UTC. Never again does lunch have to be boring.

Thailand: If you're in the right place at the right time, you can he the Thai national program on 4830 and 6070 kHz from 0000-0100 ar from 1100 until the 1600 UTC sign off. This program is not the sam as Radio Thailand. (RNMN)

Turkey: Here is the rather short schedule for the Voice of Turkey Ankara. These English broadcasts a valid, says VOT, through Decemb 31.

0300-0400	9560, 17760 [E. North America, S.E. Asia]	
1230-1300	15260 [South Asia]	
2000-2100	7215 [Europe]	
2200-2300	7135, 9505, 9560, 17760	

USSR: Ever get a Radio Moscow schedule in the mail? Ever notice that they always left you guessing as to where they were on the dial? For example, RM would print a frequency as 6.18, leaving you guessi if that last, missing number was a zero or a five. Well, glastnost has come to Radio Moscow schedules.

Take for example this, most recent version, good through March 5, 1988...

```
To Eastern North America
```

2300-0000 5915, 5940, 6045, 6115, 7115, 7150, 7215, 7310, 11770, 12050, 13665, 15425, 15455, 17700.

0000-0100 5915, 5940, 6000, 6045, 6115, 7115, 7150, 7215, 7310, 1177 12050, 13665, 15425, 15455, 17700

0100-0200 5915, 5940, 6000, 6045, 6070, 6115, 7115, 7150, 7215, 7310 9580, 11770, 12010, 12050, 13665, 15455

0200-0300 5915, 5940, 6000, 6045, 6070, 6115, 7115, 7150, 7210, 721, 7310, 9580, 11770, 12010, 12050, 13665 0300-0400 5915, 5940, 6000, 6045, 6070, 6095, 7115, 7150, 7260, 7310

-0400 5915, 5940, 6000, 6045, 6070, 6095, 7115, 7150, 7260, 73 9580, 11770, 12010, 12050

To Western North America

0400-0500 6095, 6150, 6190, 7260, 7290, 11790, 12010, 12050 0500-0600 6095, 6150, 6190, 7260, 7290, 7345, 11790 0600-0700 5905, 6095, 6150, 6190, 7290, 7345 0700-0800 5905, 6150, 6290, 7290, 7345

Can global peace be far away?

The Soviets have added three new 45 minute weekend programs as well: Nikolai Kurnakov's "From Moscow with Jazz" (Saturdays), "Talk Over" (Sundays), and Tankred (Tankred? Red Tank?) Golyenpolsky's "Conversations" (Sundays). "Talk it Over," alternates with "Conversations."

U.S.: Many U.S. stations seems to have dropped that strange, 9852.5 frequency. Seems it was getting clobbered by interference.

Yugoslavia: Anyone heard Yugoslavia's two new 500 kw transmitter yet? They're supposed to be in use for their 1730 and 1900 UTC broadcasts on 5980 and 6100 kHz.

International Waters: Look for long-time British pirate on 6338 kHz. It's testing on shortwave right now. (RNMN)

And that's enough tips for this time. Let's see how you're doing by opening the floor to Ms. Gayle Van Horn and the talented readers of America's favorite monitoring magazine, *Monitoring Times*...

RADIO ROUNDUP: Broadcast Loggings

0012 UTC on 9600

PORTUGAL: R. Renensenca.Portuguese. Interval signal heard under R. Moscow. Too bad Moscow covers it! (B. Mac Gibbons, Gresham, OR) Thanks for the log, Bruce! - ed.

0040 UTC on 3250

HONDURAS: R. Luz y Vida. Spanish. Lengthy local news and announcements. 'Easy-listening' music and 0100 ID.

0042 UTC on 18710 USB

PITCAIRN ISLAND: Not a shortwave log but interesting station to try for as they are regularly in touch with Wellington, New Zealand. (B. MacGibbons, Grsham, OR) - let's hear it for exotic DX Bruce! - ed.

0045 UTC On 11880

SPAIN: Spanish Foreign R. Report and interesting views on the New World Ballet of Caracus, Venez, and visiting Spain. (R.Fraser, Cohasset, MA)- first time contributor - welcome, Bob! - ed.

0057 UTC on 3370

GUATEMALA: R. Tezulutlan. Spanish. Very weak instrumental marimba music Tezulutlan ID @ 0100 into news reeporting format.

0100 UTC on 9575

ITALY: R.A.I. Usual news including Italian monies invested in Spain and shoe exports news. (R. Fraser, Cohasset, MA)

0100 UTC on 9435

ISRAEL: KOL. News on Journalist Charles Glass escape in Lebanon. (T. Jones, Memphis, TN) - welcome to Radio Roundup, Tony - ed.

0105 UTC on 3360

ECUADOR: R. Federacion. Spanish. Latin pop vocals, local time check, singing ads into more pops.

0115 UTC on 3395

ECUADOR: R. Zaracay. Spanish. Zaracay promo and local ad. Newscast on mostly local times.

0130 UTC on 6005

ASCENSION ISLANDS: BBC. Play of the Week program on Sir Arthur Canon Doyle. Some interference. (T. Jones, Memphis TN)

0135 UTC on 4845

BRAZIL: R. Nac'l-Manaus. Portuguese. Popular Brazilian pops with music titles, and Nac'l ID.

0140 UTC on 15170

TAHITI: R. Tahiti. French/Tahitian. Pro style music in English and French. Very strong signal! (L.W. Lee, Richmond, KY) - sounds like a great DXpedition, Loy! - ed.

0200 UTC on 9475

EGYPT: R. Cairo. Program on ancient Egyptian land areas. Usual noisy signal. (T. Jones, Memphis TN)

0200 UTC on 17795

AUSTRALIA: R. Australia. Aussie theme music, international news and feature on India with text and sitar music.

0200 UTC on 6025

DOMINICAN REP.: R. Amanecer. Spanish. New religious station heard for several nights past 0200. Check 1570 MW for address in WRTH. (J.Tuchscherer, Neenah, WI.) - thanks for the tip John! - ed

0201 UTC on 11745

BRAZIL: R. Bras. Text on new hydroelectric dam project and national news of Brazil. (T. Linz, New Orleans, LA.) - welcome to MT, Thomas - ed

0220 UTC on 4785

COLOMBIA: Ecos del Combeima. Spanish. Bolero sounding Colombian folk. Break at 0230 for an ID with local Ibague news announcements

0220 UTC on 11785

BRAZIL: R. Guaiba. Portuguese. Rapid Brazillian pops, local IDs with phone #. More talk on Porto Alegre. (T. Linz, New Orleans, LA)

0235 UTC on 4790

PERU: R. Atlantida. Spanish. Several Atlantida IDs, time checks and quite nice Peruvian flute music.

0245 UTC on 5889

CLANDESTINE: R. Liberacion. Spanish. Political rhetoric condemning Nicaragua. Spanish 'ranchero' music. News on El Salvador president. ID and speeches. On past usual 305 sign-off.

0307 UTC on 4960

MADAGASCAR: R. Madagasikara. Malagasy. Native African music and talk from female. ID @ 0312. Horn instrument introduces new program features.

0330 UTC on 7475

TUNISIA: R. Tunis. Arabic. Sign-on NA and station ID, brief comments before Qu'ran. Arabic music at 0345. Parallel 7310 fair.

0350 UTC on 7430 GREECE: VOICE OF GREECE. Male singer singing Greek folk music. (L.W. Lee, Richmond, KY)

0405 UTC on 3211

MOZAMBIQUE: R. Mocambique. Portuguese. Very poor signal as male announcer barely audible. African music and feature by lady. Parallel 4864 just as bad tonight.

0415 UTC on 9800

FRENCH GUIANA: R. France Int'l. News of unstable Persian Gulf situation (T. Jones, Memphis, TN)

0417 UTC on 4910

ZAMBIA: R. Zambia Vern. African hilife muisic, Zambia ID @ 0420, fanfare and talk from two announcers.

0425 UTC on 4880

SOUTH AFRICA: R. Five. Music from Elton John and Michael Jackson. "10 minutes to 7" time check and "When Smokey Sings" song.

0431 UTC on 5015

CLANDESTINE: R. Truth. Bird interval signal, ID, trumpets fanfare and talks about Namibia. Bird i.s. and sign-off @ 0500.

0457 UTC on 4904

CHAD: R. Nat'l Tchadienne. French/English. NA and children's chorus at sign-on. ID, cock crow and "good morning, wake up, - let's go" (in English) Morning chat and news format.

0500 UTC on 4830

GABON: Africa #1 French. ID by female announcer followed by jazzy Afro music. (T. JOnes, Memphis, TN)

0526 UTC on 5047

TOGO: R. Togo. French. Chime melody interval signal, NA and sign-on ID. French and English classical music followed.

0531 UTC on 5020

NIGER: LV Du Sahel. French. Chorus NA, flute interval signal, and "good morning ladies and gentleman" into Qu'ran recitations.

0550 UTC on 17780

MARIANA ISLANDS-SAIPAN: KYOI Saipan. 'Canned' station promotional as "All Hits KYOI" with rock music. (R. Pearson, St. Augustine, FL)

0605 UTC on 4915

GHANA: GBC. National news of Ghana, rural development news and native African music.

0611 UTC on 9540

NEW ZEALAND: R. New Zealand. Local weather forecast, UTC time check into instrumental classics.

ANGOLA: Er do Lobito (T). Unknown. African music with native 'chanting' and drums. Very poor signal. All music program. Log submitted as tentative. (R. Pearson, St. Augustine, FI)

0630 UTC on 4845

MAURITANIA: ORT de Mauritanie. Arabic. Guitar interval signal and ID into Qu'ran recitations. (B. Mac Gibbons, Gresham, OR))

0637 UTC on 6046

COLOMBIA: R. Melodia. Spanis. Good clear signal for Latin music and IDs at 0650 and 0701. (B. Mac Gibbons, Gresham, OR)

0658 UTC on 9545

SOLOMON ISLANDS: S.I.B.C. 'Island' music, SIBC Id with freq schedule DJ with music dedications and English pop selections.

0705 UTC on 7105

MONACO: TWR. Christian contemporary music and interview on religious education in the U.K.

0715 UTC on 6090

LIBERIA: ELBC. Ad for Cherry coke and into Liberian National Police Report at 0717. (B. Mac Gibbons, Gresham, OR)

0803 UTC on 6000

BRAZIL: R. Guaiba. Portuguese. News covering Rio. "Radio Guaiba" into music program.

0805 UTC on 6010

BRAZIL: R. Inconfidencia. Portuguese. Station ID with 'canned' promo. local time check and phone-in talk.

0810 UTC on 6040

BRAZIL: R. Clube Paranaense. Portuguese. Local time, "Clube" ID, pop music and ballads.

0819 UTC on 6020

BRAZIL: Gaucha. Portuguese. Enthusiastic announcer with , "bom dia de Radio Gaucha" (good morning from Radio Gaucha) and morning news with weather temps.

COLOMBIA: LV de la Selva. Spanish Cumbia Colombia folk styles, ID as, "esta es la voz de la Selva de Caqueta" and time check. R. Cultura Brazil underneath signal.

0830 UTC on 6090

BRAZIL: R. Bandeirantes. Portuguese. "bom dia de Sao Paulo", ID, music dedications into Brazilian pops.

0920 UTC on 4996

PERU: R. Andina. Spanish Peruvian folk styles and local ads. Continued beautiful flute music.

UTC on 4945

BOLIVIA: R. Illimani. Aymara/Quecha. Station ID and news covering Bolivia. Bolivian folk with flutes and radio drama. - Illimani recently reactivated on 4945 to 0359 sign-off with NA. - ed. (thanks for the tip John T.)

Page 1

0945 UTC on 4805

BRAZIL: R. Dif. do Amazonas. Music of pops and ballads. Amazonas promo, and time checks.

Send your loggings to Gayle Van Horn, 160 Lester Drive, Orange Park, Florida 32073 USA. All loggings are of English broadcasts unless otherwise noted. Logs without contributor name are the editor's loggings.

0946 UTC 9775/11505

CHINA: CPBA-2 Chinese music with children singing. Time pips @ 1000 will ID. Don't believe I've ever heard 9775 before. (B. Mac Gibbons, Gresham, Time pips @ 1000 with OR) - nice log, Bruce.

0950 UTC on 6135

BRAZII: R. Aparecida. Portuguese. Ballads and DJ chit-chat on phone, ID and Brazilian pops.

0955 UTC on 4875

BRAZIL: R. Nac'l - Boa Vista. Portuguese. Severe HET on frequency, but news, 'easy-listening' and Nac'l promos making it!

1000 UTC on 4780

VENEZUELA: LV de Carabobo. Spanish Sign-on with national anthem, ID @ 1002 Ads and lots of talk on city Valencia. (B. Mac Gibbons, Gresham, OR)

1010 UTC on 5050

ECUADOR: R. Jesus Gran Poder. Spanish. Morning religious devotionals with choral and organ hymns.

1035 UTC on 6070

CANADA: CFRX Toronto. News headlines, area forecast and temps, morning traffic report and Merril Lynch ad.

1055 UTC on 6150

COSTA RICA: R. Impacto. Spanish. Public service announcements, NA @ 1100 and "buenos dias Costa Rica". ID and news of Central America.

1100 UTC and 5975

COLOMBIA: R. Macarena, SPanish. Promo for Macarena newscast, ID and time tones with bank ad and Latin pop music.

1200 UTC on 11650

CHINA R. Bejing. National news of China and South Asia followed by industrial report of China.

1230 UTC on 11775

ANTIGUA: BBC relay. "The Valley of Fear", Part 1 a Sherlock Holmes adventure. (R. Fraser, Cohasset, MA)

1240 UTC on 15320

AUSTRIA: R. Austria Int'l. "S.W. Panorama" - Part 3 of "IDs of the 1960s". (R. Fraser, Cohasset, MA)

1315 UTC on 15305

NORWAY: R. Norway Int'l. Report and interview on Norway's film industry and annual film festival. (R. Fraser, Cohasset, MA)

1358 UTC on 11820

SRI LANKA: TWR Announcer with, "this is TWR" and Hindu/Urdu schedule. "This new frequency. (B. Mac Gibbons, Gresham, OR) SRI LANKA:

1400 UTC on 15400

FINLAND: R. FInland. Signing off with an ID. No national anthem noted. Parallel 15305/15185 good. (J. Kline, Santa Monica, CA) - thanks for the logs, James! - ed

1429 UTC on 9720

SRI LANKA: SLBC. Religious message and ID @ 1430 followed by more of the same. (B. Mac Gibbons, Gresham, OR)

1443 UTC on 9840

GUAM: KTWR Just caught the ID before the end of program transmission @ 1459. (J. Kline, Santa Monica, CA)

1456 UTC on 7115

SWAZILAND: TWR Interval signal and English ID into Malagasy programming @ 1500. (B. Mac Gibbons, Gresham, OR)

1535 UTC on 9545

INDIA: AIR Newscast to 1545 Parallel 10335 poor signal. (B. Mac Gibbons, Gresham, OR)

1600 UTC on 15295

USA: WINB. Program of, "International Freedoom Alert" on Soviet presence and threat to Southern Africa. (D. Mc Cants, Trusville, AL) welcome to MT, Donald! - ed

1630 UTC on 11875

USA WYFR Program on Science, Scripture, and Salvation" on Christian evangelism. (D. Mc Cants, Trussville, Al)

1751 UTC on 11875

AUSTRALIA: ABC Perth, Pop songs by lady DJ. Station is now 24 hours as mentioned on "Talkback". (B. Mac Gibbons, Gresham, OR)

2006 UTC on 15020

SYRIA R. Damascus. Program features with Radio Damascus ID Parallel 12085 poor. (J. Kline, Santa Monica, Ca)

2030 UTC on 9715

MADAGASCAR: R. Nederland relay. Tome Meyer's wonderful "Happy Station" program (R. Fraser, Choasset, MA))

2035 UTC on 9510

ALGERIA: R. Algeria French/Span. Radio Algeria withnews briefs into classical and Arabic music styles. (S. Zackery, Lake Charles LA)

2120 UTC on 11705

USA WRNO Elvis music medley from the 60's with local ads.

2220 UTC on 15330

MOROCCO RTV Marocaine. Arabic. Very weak signal with arabic singing under AFRTS. 15105 weak also. (T. Linz, New Orleans, La)

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SHORTWAVE RADIO NRD-525 .09-34 mhz,200 Memorys,Scans,Ultimatel....1,169.00 ICOM ICR-71/A 100khz-30mhz,32 Memorys, Scans....799.95 SONY AN-1 Indoor Active Shortwave Antenna....
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POLICE/FIRE SCANNERS

POLICE/FIRE SCANNERS

REGENCY
TS-2 75ch,29-54,118-175,406-512,806-999mhz. 348
TS-1 35ch,29-54,118-175,406-512,AM/FM. 255
MX-3000 30ch,30-50,138-174,406-512,AC/DC. 199
Z-60 50ch,30-50,88-108,118-174,406-512,AM/FM. 155
Z-45 45ch,30-50,118-174,406-512,AM/FM. 155
R-1090 45ch,30-50,138-174,406-512mhz. 156
R-1080 30ch,30-50,138-174,406-512mhz. 148
R-1075 15ch,30-50,138-174,406-512mhz. 129
HX-1500 55ch,29-54,118-174,406-512mhz. 219
BEARCAT/UNIDEN
BC-800XLT 40ch,29-54,118-174,406-512mhz. 219
BC-200XLT NEW!! Call for Price. 246
BC-210XLT 20ch,29-54,118-174,406-512mhz. 225
BC-300 50ch,30-50,118-136,421-512mhz. 225
BC-300 50ch,30-50,118-136,421-512mhz. 275
BC-100XL 16ch,30-50,118-136,421-512mhz. 275
BC-100XL 16ch,30-50,118-136,421-512mhz. 275
BC-70XLT 20ch,29-54,138-174,406-512mhz. 188
BC-70XLT 20ch,29-54,138-174,406-512mhz. 176
ICOM R-7000 99ch,25-2,000mhz,FM/AM/SSB. 955
FREE SHPPPING/INSURANCE TO 48...1988 CATALOG...S1
USED GEAR, SPECIALS, CLOSEOUTS, ETC...SEND ONE -10SAL FREE SHIPPING/INSURANCE TO 48...1988 CATALOG...\$1 USED GEAR, SPECIALS, CLOSEOUTS, ETC...SEND ONE -10SA! FREE FULL BENCH TESTING.

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2233 UTC on 4900

GUINEA: R. National Vern. 1 hour conversation from two males, African hilli music at 2333. Into French @ 2337 with African pops. Guitar interval sign ID, National Anthem, and 0001 sign-off.

2240 UTC on 9940

CLANDESTINE; La Voz de CID. Spanish. Latin music to 2300 followed by newscast and what sounded like a radio play. (P. Farris, Albany, NY) anoth new contributor - welcome, Peter! - ed

2250 UTC on 4990

NIGERIA: R. Nigeria-Lagos. Jazz music program, ID with schedule @ 2300 National news of Nigeria.

UTC on 4870

BENIN ORTV Du Benin. French CLock chimes, ID as "Radio du Benin" mus from Beverly Hills Cop I. Closing ID, "good bye friends", NA and 2300 sig

2302 UTC on 4835

MALI: RTV Malienne. French. Terrific African music, "ici Bamako" ID, Afro French pops, interval signal, martial NA and 0001 sign-off.

2310 UTC on French 4850

CAMEROON: R. Cameroon-Yaounde. French. Male and female with conversation, French vocals and FAX interference.

2310 UTC on 4850

BURKINA FASO: RTV Burkina. French. African pop music by DJ. CLosing comments balafon interval signal, ID, NA, and sign-off @ 0000.

UTC on 14802 USB

KIRIBATI R. Kiribati. (T) Kiribati. Fast pop music amid excessive noise. Male announcer heard as signal peaks. Log tentative.

2315 UTC on 4910

HONDURAS: LV de la Mosquitia. Englis/Spanish. Old-time religious music with program notes. Fading as religious text begins in Spanish.

UTC on 4940

COITE D' IVOIRE RTV Ivorienne. French Music from B.B. King, Madonna, and Janet Jackson's 'Control' hit. DJ really enjoying himself as he sings along! Closing ID, choral NA, and 0001 sign-off.

2335 UTC on 4825

BRAZIL: R. Educ. Branganca. Portuguese. Very rapid commentary of soccer game. Occasional breaks for talk and ads.

Next year's release of a model BC1000XLT Scanner from Uniden will be somewhat less ambitious than originally proposed. Hopes for a tuning dial, S meter and a few other advanced features faded when the manufacturer found out what the costs would be.

The scanner market is tightly competitive and the depressed value of the dollar has done its part to discourage American importers. Still, the message from the consumer regarding the desire for wide frequency coverage has been heard and many new models will reflect that trend.

On Thursday, September 17, 1987, the Federal Communications Commission (FCC) adopted **new rulemaking on Part 15 of the Rules and Regulations** regarding incidental radiation devices. As proposed, a complete overhaul would discard specific design restrictions on devices, leaving only the emission control regulation.

The new rewrite would not only open up the market for unlicensed radio devices for home use such as wireless links between computers and keyboards, VCRs to TVs, and so forth, but would seem to eliminate the prospect that radios could be forbidden by law from receiving certain frequency ranges. (Thanks to Bob Horvitz for this news note)

Scanner Listeners near the Persian Gulf are hearing warships challenge civilians. Commercial aircraft and vessels are battling it out over the airwaves with military vessels as tensions continue to mount. Most commonly heard are queries concerning cargo and warnings regarding restricted lanes.

Occasional harrassment, catcalls and obscene transmissions punctuate the maritime and aircraft frequencies, making routine communications difficult at best. (Clippings sent by Bill Black, Washington, DC; Don Schimmel, Vienna, VA)

Karl Holt of Delhi, New York, still enjoys listening to the old tube-type sets like his Hallicrafters Sky Champion (bottom left) and S-38D (bottom center). Considerably more recent are his Radio Shack multiband portable and Panasonic RF-B300 (bottom right).



Don't throw away those old books and radios! From time to time we receive donated publications from our readers who no longer wish to keep early radio books and equipment manuals.

Please don't discard them. If you can't find a local recipent and wish to donate them, send them to MT; we'll see that they get a good home!

The same plea extends to early radio equipment, especially prewar receivers. The rapid advance of high-tech electronics has created a groundswell of nostalgia and collectors of old radios abound. Even incomplete or damaged radios have their place among a few dedicated individuals, either for parts to restore other pieces or to be restored themselves.

Conservationists are still opposing the Air Force with the result that the construction of several military communications towers has been postponed in Rhode Island, Massachusetts and Maine. Legal action is pending against the government, brought about by Boston-based Conservation Law Foundation.

The proposed sites would be part of a \$1 billion nationwide network of 127 300-foot towers, separated by 200-300 miles and an additional 228 two-way radio stations, comprising the low frequency Ground Wave Emergency Network (GWEN).

Defense Department officials hold that the system is a vital backup to communications which would be disrupted during nuclear attack; opponents disagree, citing invitation of attack to small towns, environmental impact of each 11 acre installation, and prolonged nuclear war. (Report from Dave Alpert, NY, NY)

We've all seen satellite weather maps on the evening news, and we've heard about special subscription programming superimposed on SCA-equipped FM broadcast stations, but now in some areas satellite weather maps are being transmitted by FM broadcast stations.

Radair, of San Antonio, Texas, is marketing a new receiving system, primarily for airline cockpit use, which shows National Weather Service weather radar images in full color and in real time. The images can be displayed on the aircraft's local radar display or even a portable or pocket TV.

Joystick control allows choice of locale to zoom in on; the display can be "uncluttered", permitting areas of heavy precipitation to be shown. Historical information from previous sweeps is also stored, allowing progressive weather front or storm sequences to be displayed. (Clipping from Dave Alpert, NY, NY)

Interested in some serious HF DXing? The Australian Department of Sciences now has a highly refined, low cost **frequency and propagation prediction service.** For only \$20 including postage anywhere in the world, hams and SWLs may subscribe to one year's worth of monthly custom propagation charts, up to 18 circuits between any two points on the globe.

An informative manual accompanies the service, illustrating the principles of radio wave propagation and explaining the symbols used on the charts. For more information or to subscribe to the service, write to IPS Radio and Space Services, PO Box 702, Darlinghurst, NSW 2010. (Sample sent in by Jeff Bell, Rivervale, Western Australia)

How many people really listen to shortwave? In our October column we reported an estimate by the Electronic Industries Association (EIA) that roughly one-third of the American population listens to shortwave based on a dazzling 450 million radios.

Worldband radio expert Larry Magne strongly disagrees. His article in the Wall Street Journal (October 1, 1987) estimates that a far

more conservative 4% of the American population, some 10 million citizens, share our shortwave hobby.

Magne suggests that the EIA report probably depended upon a highly erroneous guesstimate made some years ago which was based on a Department of Commerce account of the number of "multi-band radios" in the country.

Since the multiband radio category includes scanners, weather radios, TV sound receivers, shortwave receivers, and anything else that isn't a garden variety AM/FM set, the reason for the exaggerated estimate becomes clear.

Police agencies around the country are discovering that the cellular telephone frequencies are a haven for organized crime. A recent report in Newsweek magazine quotes KeKalb County (Atlanta), Georgia, police spokesman Gary Williams: "Cellular phones are the worst thing to happen to law enforcement since Miranda."

Dope dealers use cellular phones constantly; as a car passes from one cell (repeater site) to another, the frequency changes making continual surveillance nearly impossible. Law enforcement technologists think that it is only a matter of time--and money-before the good guys have electronic equipment to track the bad guys.

Captain Midnight: Part Two could well be the title of the most recent satellite piracy episode. On Sunday night, September 6, at 9:55 PM EST, Playboy Channel viewers were interrupted while watching the movie "Three Daughters" by the message, "Repent your sins. Keep the Sabbath Holy " (or, "Repent, the end is near"--we have had two different reports of the message).

The legitimate uplink station reports that it was transmitting full power at the time, indicating that the overriding uplink must have used substantial power to accomplish its nefarious task.

The FCC is actively investigating, but are not as optimistic about catching the intruder as they were with the John McDougall (Captain Midnight) caper of April 1986 because they have no tape of the ten-second illicit transmission to analyze. Furthermore, it is suspected that the transmission came from a transportable earth station, making location hard to determine.

For those of us who really enjoy DXing obscure parts of the world, treating ourselves to elusive catches not heard in some years, happy days are here again. Scientists have confirmed that we have passed the sunspot minimum and are well up the ascending path to a 1989-1992 maximum for sunspot cycle 22.

The bottom line of all of this is that shortwave monitoring will get better and better over the next several years, with distant signals getting stronger and more reliable. This will also result in amateur and other two-way users of the HF spectrum experiencing longer paths of communications with attendant interference from distant stations.

The FCC has granted a two year extension to Airphone to prove the viability of its air-to-ground commercial telephone service. Sixteen airlines are presently utilizing the experimental system on a total of 500 aircraft. Calls cost \$7.50 for the first three minutes and may be made from a cordless phone at the passenger's seat, soon to be replaced by telephones mounted on the seats' backs.

Frequency ranges assigned to the air-to-ground telephone service are 849-851 MHz (aircraft) and 894-896 (ground), changed from their previous allocation which had a potential for interfering with studio-to-transmitter (STL) broadcast links.

Zimbabwe (formerly Rhodesia) residents are finding out that they must step lightly to avoid radio and TV interference.

Apparently, shoes made from the hides of certain cattle and elephants from draught areas contain semiconductor junctions of aluminum salts due to the unusual grass diets of the animals. When the wearer walks on carpeting, static electricity produces considerable radio frequency interference!

The phenomenon was reportedly first noticed by a man dancing in his living room to the music heard over an FM station; each time he took a step, he rhythmically interfered with his radio reception!

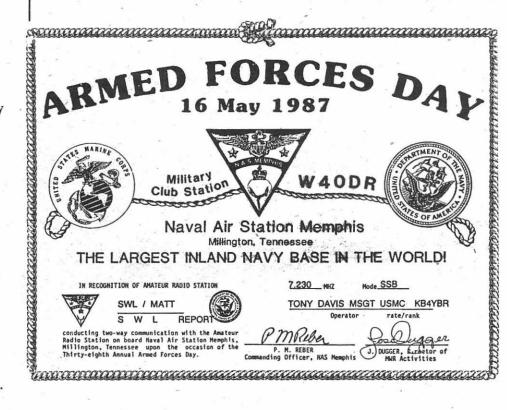
The shoe manufacturers acknowledge the problem and are exchanging the radio-active shoes with more docile pairs.

(Last four items from Fred Maia's W5YI Report)

In an effort to increase their revenues, the state of California will now collect taxes from mail order sales to its residents. Designed to cash in on TV home shopping services and major mail order firms, only those companies shipping to California with tax liability exceeding \$50,000 per month will be affected.

The California Assembly Bill AB 229 was introduced January 12, 1987, and signed into law scarcely eight months later on September 8, 1987 after receiving a 65-7 vote in June. The California Board of Equalization estimates that the measure will increase revenues from mail order by \$96 million annually; additional unknown revenues from home TV shopping should be substantial.

Matt Haston of Tennessee sent "Utility Intrigue's" Don Schimmel a copy of the attractive certificate he received for his participation in Armed Forces Day last spring. You, too, could have one of these on your wall! Thanks, Matt.



Dayton Public Safety Communications -

A Model for the Nation

by Anthony Cono

"The most advanced radio system in use nationally and perhaps interna-tionally" - This is the way that Dayton, Ohio's, new radio system has been described.

Motorola radio was contracted to install the trunked radio and a computer aided dispatch/management information system (CAD/MIS). On June 28, 1987, the city of Dayton began operations on this new system.

The vehicular radios can be programmed as mobile telephones by programming an access code on the radio keypad. Another option this system has is to rebroadcast non-800 MHz frequencies on their trunked system. Dayton fire dispatch can receive the Ohio mutual aid net on 154.28 MHz and rebroadcast it on the trunked system.

All police, fire and rescue vehicles are equipped with the CAD/MIS terminals, referred to as "KDTs." The police department uses them for dispatching along with voice, onscene and in-service dispositions, records checks, and car-to-car communications.

The fire department is using theirs for dispatching along with voice, carto-car communications and unlimited information on handling hazardous materials (HAZMAT).

All KDTs, portable and mobiles have an emergency to be used for officer/firefighter-down calls or any

other in-trouble calls that the officer/firefighter cannot audibly call

At the beginning of each shift all police officers advise dispatch of their crew number, cruiser number and radio number. All fire and rescue radios are assigned to a specific vehicle rather than specific personnel.

When an emergency button is activated the dispatch terminal will lock up and display the crew and radio in distress. The only way to reset the alarm is to turn the radio off for ten seconds.

All police, fire and rescue radios have eight channels and each channel has a choice of five frequencies (expandable to ten). This type of system is difficult but not impossible to monitor: Don't use the "delay" function on your scanner but push the "scan" button to keep up with a specific conversation.

a trunked system, one ncy is designated as a frequency "control" frequency; it is changed daily between 0001 hours and 0015 hours. You will have to lock out this data channel because its buzz will stop your scan sequence.

With the implementation of this new nine-million-dollar system, Dayton has taken public safety into the twenty-first century and enhanced officer safety.

Frequencies and Dispatch Signals

WCNA303

856/811.2125 857/812.2125 858/813.2125 859/914.2125 860/815.2125 856/811.2375 859/814.2375 857/812.2375 860/815.2375

Dayton is currently using the ".2125" frequencies; the ".2375" frequencies are reserved for future expansion.

Police Radio Channel Allocations:

- 1-A West dispatch districts
- 2-B Records
- 3-C East dispatch districts 1+2
- Citywide car to car
- Detectives
- Detectives
- Special events
- Tactical/Administration

Fire Radio Channel Allocations:

- 1-A Dispatch
- Subfleet Bravo 2-B
- Subfleet Charlie 3-C
- Subfleet Delta
- Subfleet Echo
- **EMS**
- 7-G EMS to Fire
- 8-H Mutual Aid

Note: Subfleet channels are primarily used as fire ground

Signals and Codes:

- 11 Lunch
- Not available for dispatch 12
- No problem, officer is OK
- Officer in trouble
- In service/On duty
- In service, no report
- 202 In service, report made
- In service, unfounded 203
- 204 In service, unable to
- locate
- Out of service/Off duty
- On the scene

- 400 Call given number Code A Channel closed for emergency traffic
- Tone Emergency run
- E crew Evidence technicians
- GTA Grand theft auto
 - Personal injury accident
 - PD Property damage accident
- ABV Abandoned vehicle
- OR Owners request for tow truck
- DIF Death in family

Unit Numbers:

- 001 Administration
- 100 1st district cars NE
- 2nd district cars SE
- 300 3rd district cars SW
- 400 Detectives
- 500 5th district cars NW
- 600 Traffic light repair crews
- Detectives
- Detectives 800
- CBD cars
- 900 Detectives
- Festival squad
- Parking control squad
- Tactical response team
- Motorcycle squad
- Walking squad
- Traffic service and accident investigation cars
- HNT Hostage negotiations team
- BDU Bomb disposal unit





West Coast Monitoring

CAL	IF	OR	NI	Δ
UML		σ	141	~

contributed by Andrew Munoz, Sr. Modesto, Cal.

48.44

155.025

155.295

453.65

155.54

152.45

155.985

150.845

153.95

154.75

158.835

Ripon 155.925 155.37

Stockton

41.8

120.3

155.16

47.9

47.1

455.65

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160.65

161.55

160.38

453.925

152.39 451.35

162.0

39.02

452.575

Ch#2 Irrigation District

School district mainten-

Continental

School district buses

Tow Service Vern's

Air National Guard

Calif State Auto Assoc

Calif Water Comp Calif Youth Authority

Attchison-Topeka-Santa

Attchison-Topeka-Santa

Telephone Maintenance

Telephone marine opera-

Ambulance Delta

News TV Ch 13

Southern Pacific

Security Day-night Yellow Cab

Union Pacific

Airport tower

Cal/Trans

Fe F-3

Fe Yard

Public Works

Public Works

ance

Taxi

Co.

Ch#1

Ch#1

Ch#2

F-1

Telephone

mouesto,	Cui.		**************************************
San Joac	quin County	464.65	Telephone mobile
155.4			operator
155.34	Ambulance to hosp F-2	464.625	Tow Service Jack's
463.0	Paramedics	151.745	Univrsity of Pacific *
453.65	Ch. #1 Net A	173.375	News (TV)
453.375	Ch. #2 Net B	48.1	Water Control
463.325	Ch. #3 Net C;Co. Jail	453.7	Government
155.025	Stockton	153.92	Public Works
154.07	Ch #1 coordination	464.625	School district
154.13	Ch #2 dispatch	453.225	Transit District-Metro-
154.755	Sheriff Ch#1 (in:155.61)	460.525	Ch#1
155.79	Sheriff Ch#2 information	460.575	Ch#2
460.125	Sheriff Tac 1	453.15	Ch#3
460.35	Sheriff Tac 2	460.4	Ch#1
		460.25	Ch#2 Traffic
Escalon		46.025	Old
155.925		46.54	Old
154.13	F-1	* * * *	
159.15	F-1	Port of S	Stockton
		154.83	Police
Lodi		158.745	
155.28	Community Hospital		
155.205	Ambulance Co.	Tracy	
155.265	Unified School District	47.84	Irrigation District
154.04	Public Works	155.895	Public Works
154.01	Fire	154.31	F-1
154.785	Police	155.37	Ch #1
Manteca			
47.78	Ch#1 Irrigation District	LAS	VEGAS, NEVADA
40 44	OL #0 T D' + : +		,

LAS	VEGAS.	NEVADA	١

Contributed by Todd Shideler

As of July '86, the Las Vegas Police changed their frequencies, which also cover Clark County.

Ch	Freq	Use
1	159.150	Wants/warrants/
Files.	40.	detectives nights
2	159.090	South Patrol
3	158.970	Car-car/Stakeouts
4	158.745	NE/Downtown patrol
5	159.210	Supervisors/Tactical
6	159.030	West patrol
7	158.790	Rural units (Laughlin,
		etc)/Detective days
8	156.210	Car-car/Detectives/
		Special events
9	154.890	Special events
10	154.830	SWAT/Narcotics/Vice
12	155.910	Narcotics/Internal
		Affairs (simplex)
	453.925	DA Office
	153.800	County jail (simplex)
	158.925	Marshalls/court
	-	security
	1	1972
Not	HIERON .	
CI-		

Ch.5 can be scrambled DVP Ch.8 called Ch.12 by patrol Ch.10 called "B" channel by SWAT and is called Ch.9 by Vice Ch.7 used by units outside city including Indian Springs, Charleston, Jean, Mohave, Laughlin,

MISCELLANEOUS	11.240	McClellen weather
	6.650	Panama ATC?
Contributed by	6.226	Numbers in Spanish Al
Michael Leary		on top of Spanish
Seattle, Washington		numbers in USB
	11.183	Scott working MAC
6.680 Honolulu weather		70019
6.754 Edmonton military	13.283	Honolulu weather
weather	13.307	? ATC
6.507 USCG Guam weather	8.893	Cambridge Bay to 41
13.115 USCG Guam weather		?ATL
° 0°N-50°N, 110°E-180°E	13.284	Honolulu weather
15.032 McClellen weather	8.779	Scrambled USN
13.272 New York Radio Av	6.706	Trenton/Edmonton
weather	11 110	military
14.489 MARS phone patch	11.118	Calmlake to Phosphate
12.629 Numbers, Spanish	11.283	Dispatch to United 803
8.766 Honolulu Sea weather		descend to warm up fue
6.579 New York ATC	14.776	Phospate with phone
11.273 Edmonton military		patch

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Canadian Coast Guard Frequencies

In the July column we took a look at the internal workings of Canadian Coast Guard Radio Stations. As a form of follow up, this month's column offers a listing of the Coast Guard stations in the Province of Quebec on VHF. The stations can also be found on MF and low frequency telegraphy. Remember that the callsign used is that for the main station rather than that for the transmitter being used, therefore callsign VCF is used rather than VES for the Grosses-Roches transmitter for Mont Joli Coast Guard Radio.

As you can see from the list below the areas served by a small number of stations has been vastly increased through the use of the remote transmitter sites. With the decline in shipping in the past five years, many manned stations have been converted over to remote control.

As always your comments are welcome to the address at top. Until next time, good listening.

156.300 VBJ Quebec CG Radio Riviere du Loup, P.Q. 156,300 **VBQ 30** Quebec CG Radio Cap-Est, P.Q. 156,300 VCF Mont Joli CG Radio Mont Joli, P.Q. 156,300 VFS Mont Joli CG Radio Grosses-Roches, P.Q. 156,300 VFII Sept Iles CG Radio Mont-Louis, P.Q. Mont St. Bruno, P.Q. 156,300 VFN Montreal CG Radio XLI 423 Ste-Anne de Bellevue CG 156,300 Ste-Anne de Bellevue, P.Q. XLM 382 156,300 Valleyfield CG Station Valleyfield, P.Q. 156.300 XLM 383 Pointe Claire CG Station Pointe Claire, P.Q. 156,300 XIM 384 Pointe aux Trembles CG Pointe aux Trembles, P.Q. 156.300 XLM 385 Ste-Anne CG Station Ste-Anne, P.Q. Chambly CG Station 156.300 XI.M. 386 Chambly, P.Q. 156,450 Quebec CG Radio **VBQ 30** Cap-Est, P.Q. 156.450 VFN Montreal CG Radio Mont SS-Bruno, P.Q. XLI 423 156,450 Ste-Anne de Bellevue CG Ste-Anne de Bellevue, P.Q. 156.450 XLM 382 Valleyfield CG Valleyfield, P.Q. 156.450 XLM 383 Pointe Claire CG Station Pointe Claire, P.Q. 156.450 XLM 384 Pointe aux Trembles CG Pointe aux Trembles, P.Q. 156.450 XLM 385 Ste-Anne CG Station Ste-Anne, P.Q. Chambly, P.Q. 156.450 XLM 386 Chambly CG Station St-Paul, Ile au Noix, P.Q. 156.450 XLM 387 lle au Noix CG 156.500 XLI 423 Ste-Anne de Bellevue CG Ste-Anne de Bellevue, P.Q. 156.550 VBJ Quebec CG Radio Riviere du Loup, P.Q. Quebec CG Radio 156,550 VCC Lauzon, P.Q. 156.550 XLM 382 Valleyfield CG Valleyfield, P.Q. 156.550 XLM 382 Pointe Claire CG Pointe Claire, P.Q. 156.550 XLM 384 Pointe aux Trembles CG Pointe aux Trembles, P.Q. 156.550 XLM 385 Ste-Anne CG Ste-Anne, P.Q. 156.550 XLM 386 Chambly CG Chambly, P.Q. St-Paul, Ile au Noix, P.Q. 156.550 XLM 387 lle au Noix CG 156.600 VCK Sept Hes CG Radio Sent Iles, P.Q. XLI 423 Ste-Anne de Bellevue CG 156,650 Ste-Anne de Bellevue, P.Q. 156,650 XLM 382 Valleyfield CG Valleyfield, P.Q. 156.650 XLM 383 Pointe Claire CG Pointe Claire, P.Q. 156.650 XLM 384 Pointe aux Trembles CG Pointe Claire, P.Q. 156.650 XLM 385 Ste-Anne CG Ste-Anne, P.Q. 156.650 XLM 386 Chambly Coast Station Chambly, P.Q. 156.650 XLM 387 lle au Noix CG St-Paul, Ile au Noix, P.Q. 156.700 Quebec CG Radio **VBJ** Riviere du Loup, P.Q. Mont Joli, P.Q. 156.700 VCF Mont Joli CG Radio 156.700 VES Mont Joli CG Radio Grosses-Roches, P.Q. 156.700 VEU Sept Hes CG Radio Mont-Louis, P.Q. 156.700 XLI 423 Ste-Anne de Bellevue CG Ste-Anne de Bellevue, P.Q. 156.700 XLM 382 Valleyfield CG Valleyfield, P.Q. Pointe Claire, P.Q. 156.700 XLM 383 Pointe Claire CG 156.700 XLM 384 Pointe aux Trembles CG Pointe aux Trembles, P.Q. 156,700 XLM 385 Ste-Anne CG Ste-Anne, P.Q. 156.700 XLm 386 Chambly CG Chambly, P.Q. 156.800 VBJ Quebec CG Radio Trois Rivieres, P.Q. 156,800 VBQ 22 Sept Hes CG Radio Natashquan, P.Q. 156,800 VBQ 30 Quebec CG Radio Cap-Est, P.Q. 156.800 Riviere au Renard CG Rad VBS Newport, P.Q. 156.800 VCC Quebec CG Radio Lauzon, P.Q. 156,800 Montmagny, P.Q. VCC Quebec CG Radio 156.800 VCC Quebec CG Radio Mont Belair, P.Q. 156.800 VCF Mont Joli CG Radio Mont Joli, P.Q. 156.800 VCG Riviere au Renard CG Rad Riviere au Renard, P.Q. 156.800 VCJ 3 Quebec CG Radio Sacre-Coeur P.Q. 156.800 VCJ 4 Quebec CG Radio Cap-Est, P.Q. 156.800 VCK Sept Iles CG Radio Sept Iles, P.Q. 156.800 VCN Grindstone CG Radio Cap aux Maules, P.Q. 156.800 Mont Joli CG Radio Grosses-Roches, P.Q.

VEU Sept Iles CG Radio Mont-Louis, P.Q. 156.800 Montreal CG Radio Mont St-Bruno, P.Q. 156.800 VFN 156.800 Montreal CG Radio Montreal, P.Q. VFN Rigaud, P.Q. 156.800 VFN Montreal CG Radio Ste-Anne de Bellevue, P.Q. 156.800 XLI 423 Ste-Anne de Bellevue CG XLM 382 Valleyfield CG Valleyfield, P.Q. 156.800 Pointe Claire CG Pointe CLaire, P.Q. 156.800 XLM 383 Pointe aux Trembles, P.Q. 156.800 XLM 384 Pointe aux Trembles CG 156.800 XLM 385 Ste-Anne CG Ste-Anne, P.Q. 156.800 XLM 386 Chambly CG Chambly, P.Q. 156.800 XLM 387 lle au Noix CG St-Paul, Ile au Noix, P.Q. 156.950 VR.I Quebec CG Radio Riviere du Loup, P.Q. 156.950 **VBQ 22** Sept Iles CG Radio Natashquan, P.Q. 156.950 VBQ 30 Quebec CG Radio Cap-Est, P.Q. Riviere au Renard CG Rad 156.950 **VBS** Newport, P.Q. 156.950 VCC Quebec CG Radio Mont Belair, P.Q. 156.950 VCF Mont Joli CG Radio Mont Joli, P.Q. Mont Joli CG Radio 156.950 VES Grosses-Roches, P.Q. 156.950 VEU Sept Iles CG Radio Mont-Louis, P.Q. 156.950 VFN Montreal CG Radio Montreal, P.Q. 156.950 VFN Montreal CG Radio Riquad, P.Q. 156.950 XLI 423 Ste-Anne de Bellevue, P.Q. Ste-Anne de Bellevue CG 156.950 XLM 382 Valleyfield CG Valleyfield, P.Q. 156.950 XLM 383 Pointe Claire CG Pointe Claire, P.Q. 156.950 XLM 384 Pointe aux Trembles CG Pointe aux Trembles, P.Q. 156.950 XLM 385 Ste-Anne CG Ste-Anne, P.Q. 156.950 XLM 386 Chambly, P.Q. Chambly CG 156.950 XLM 387 lle au Noix CG St-Paul, Ile au Noix, P.Q. 157.100 **VBJ** Quebec CG Radio Riviere du Loup, P.Q. Quebec CG Radio 161.650 VCG Lauzon, P.Q. 161.650 VCG Riviere au Renard CG Rad Riviere au Renard, P.Q. 161.650 VCK Sept Iles CG Radio Sept Iles, P.Q. 161.650 VCN Grindstone CG Radio Cap aux Meules, P.Q. 161.650 Mont Joli CG Radio Grosses-Roches, P.Q. VES 161.650 VFN Montreal CG Radio Montreal, P.Q. Montreal CG Radio 161.650 Mont St-Bruno, P.Q. **VFN** 161.775 VBK Montreal CG Radio Trois Rivieres, P.Q. 161.775 VBQ 22 Sept Iles CG Radio Natashquan, P.Q. 161.775 VBS Riviere au Renard CG Rad Newport, P.Q. Montmagny, P.Q. 161.775 VCC Quebec CG Radio 161.775 VCF Mont Joli CG Radio Mont Joli, P.Q. 161.775 VCJ 3 Quebec CG Radio Sacre-Coeur, P.Q. 161.775 VEU Sept Iles CG Radio Mont-Louis, P.Q. 161.775 VFN Montreal CG Radio Rigaud, P.Q. 161.800 VBK Montreal CG Radio Troi Rivieres, P.Q. VBQ 22 161.800 Sept Iles CG Radio Natashquan, P.Q. 161.800 **VBS** Riviere au Renard CG Rad Newport, P.Q. 161.800 VCC Quebec CG Radio Lauzon, P.Q. 161.800 VCC Quebec CG Radio Quebec, P.Q. 161.800 VCF Mont Joli CG Radio Mont Joli, P.Q. 161.800 VCG Riviere au Renard CG Rad Riviere au Renard, P.Q. Cap-Est, P.Q. 161.800 VCJ 4 Quebec CG Radio 161.800 VCK Sept Iles CG Radio Sept Iles, P.Q. 161.800 **VES** Mont Joli CG Radio Grosses-Roches, P.Q. 161.800 VFII Sept Iles CG Radio Mont-Louis, P.Q. 161.800 VFN Montreal CG Radio Rigaud, P.Q. 161.850 VFN Montreal CG Radio Rigaud, P.Q. 161.875 VFN Montreal CG Radio Riguad, P.Q. 161.900 VBK Montreal CG Radio Trois Rivieres, P.Q. 161.900 VBQ 22 Sept Iles CG Radio Natashquan, P.Q. 161.900 VBS Riviere au Renard CG Rad Newport, P.Q. 161.900 VCC Quebec CG Radio Lauzon, P.Q. 161.900 VCC Quebec CG Radio Montmagny, P.Q. 161.900 VCF Mont Joli CG Radio Mont Joli, P.Q. 161.900 VCG Riviere au Renard CG Rad Riviere au Renard, P.Q. 161.900 VCJ 3 Quebec CG Radio Sacre-Coeur, P.Q. 161.900 VCK Sept Iles CG Radio Sept Iles, P.Q. 161.900 VCK 2 Sept Iles CG Radio Mingan, P.Q. 161.900 VCN Grindstone CG Radio Cap aux Meules, P.Q. 161.900 VES Mont Joli CG Radio Grosses-Roches, P.Q. 161.900 VEU Sept Iles CG Radio Mont-Louis, P.Q. 161.900 VFN Montreal CG Radio Montreal, P.Q. Rigaud, P.Q. 161.900 VFN Montreal CG Radio 161.900 VFN Montreal CG Radio Mont St-Bruno, P.Q. 161.900 VFN Montreal CG Radio Montreal, P.Q. 161.900 VFN Montreal CG Radio Rigaud, P.Q. 161.950 VBS Riviere au Renard CG Rad Newport, P.Q. 161.950 VCC Quebec CG Radio Montmgny, P.Q. 161.950 VEU Sept Iles CG Radio Mont-Louis, P.Q. 162.025 VCC Quebec CG Radio Lauzon, P.Q. VFN 162,025 Montreal CG Radio Montreal, P.Q.

Montreal CG Radio

Mont St-Bruno, P.Q.

162.025

The International Q-Code

To expedite traffic handling via Morse code, network operators have devised a system of "Q codes" which specific meanings.

following abbreviated list will provide the listener with insight as to the meaning of signals copied during CW net operations.

ONA Answer in prearranged order. QNB All net stations copy. Net is directed. ONE Entire net stand by. ONF Net is not controlled. Take over as net control ONG ONH Your net frequency is high. QNI Net stations report in. ONJ Can you copy? QNK Transmit messages. Your net frequency is low. You are interfering; stand QNM Net control station is ... ONN Station is leaving the net. ONO QNP Unable to copy. Move frequency to finish QNQ traffic. ONS Following stations are in the net:... ONT Request permission to leave the net. ONU The net has traffic for you. Establish contact on this ONV frequency. How do I route messages? ONW ONX You are excused from the net. QNY Shift to another frequency to clear traffic. QNZ Zero beat your signal with mine. ORA What is the name of your station? QRE What is your estimated time of f arrival? ORG Will you tell me the exact frequency? Does my frequency vary? How is the tone of my transmission? (1)Good, (3)Bad What is the intelligibility of my signals? (1)Bad, (5) Excellent. Are you busy? Is my transmission being interfered with? (1)No,

QRN Are you troubled by static? (1)No (5)Extreme. Shall I increase transmitter QRP Shall I decrease transmitter power? Shall I send faster? Are you ready for automatic operation? EMERGENCY (Amateur only) Shall I send more slowly? ORS Shall I stop sending? Have you anything for me? Are you ready? QRW Shall I inform...that you are calling him? When will you call me again? When is my turn? Who is calling me? What is my signal strength? OSB Are my signals fading? Can you hear me if I break in on your transmission? Can you acknowledge receipt? Shall I repeat the last telegram? Did you hear me? Can you communicate with ...? Will you relay? Shall I repeat the call? OSR What frequency will you use? QSS Shall I send on this frequency? Shall I send a series of Vs for adjustment? QSW Will you send on this frequency? OSX Will you listen? Shall I change frequency? Shall I send each word or OSY QSZ

group more than once? Shall I cancel telegram



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CW Prosigns

While Q signals expedite handling on CW networks, certain dot-dash groupings called prosigns are handy for signalling information quickly to

AA Unknown Station AA All After All Before AB

AR End of transmission

AS Short Wait AR Long Wait

(5)Extreme.

More to Follow B

BK Break

BN Between BT

Long Break C Correct; Yes

Confirm

operators. A bar over the letters indicates that there is no space between the letters; they are sent as a single dot-dash group.

Do you agree with my counting

General call to all amateurs.

Closing Station COL Collate

number ...?

General Call to All CQ Stations

CS Callsigns DE From

E East EEEE Error

ETA Estimated Time of Arrival

F Do Not Answer

FM From

G Repeat Back

GA Go Ahead GR

Group Count Separative Sign II

Verify with Originator and Repeat

Invitation to Transmit

Starting Signal KA M Deferred

MSG Message N Negative; No

N North

I have nothing to send NIL

NR Number

NX Notice to Mariners 0

Operational Immediate Ocean Letter

Private radiotelegram P

P Priority PBL Preamble PSE Please

R Received REF Reference

RPT Repeat RQ Request

South

SIG Signature

SK End

SLT Radiomarine Letter Service Telegram SVC

Station Called: Transmi to all Addressees

TO Action Address

Thank You TU TXT Text

W West WA

Word After Word Before

Weather Report EX

Y Emergency

Flash

MONITORING TIMES

104 Bonsal Avenue Glenolden, PA 19036

Black Friday

Black Friday. The name sounds ominous, like an day commemorating a terrorist attack or a mudslide that wipes out a village of 10,000 people. But it isn't. Ironically, "Black Friday" is the name merchants give to the start of the Christmas holiday season -- the day after Thanksgiving -- and all it means is that their stores begin to show a profit and operate in the "black" on this day.

For the scanner buff, Black Friday is a special day, too. As if triggered by some deeply hidden biological buzzer, all of America seems to go collectively crazy. There are traffic jams, accidents, robberies, shoplifting and violent arguments over parking spots. Want to join in the fun, but avoid the crowds? Then use your scanner to do a little "frequency shopping." Our first stop: department stores. Best of all, you don't have to live next to a shopping complex to catch all the action.

Scanning Security

Sure, all of the big department stores like Sears, J.C. Penny's and Montgomery Ward all have their own security forces. But what most people don't know is that *all* department stores, regardless of size, are required by their insurance companies to have security personnel. Dressed in uniform or plain clothes, these private guards walk the floors looking for shoplifters and other undesirables.

Vern Davis, manager for J.C. in the Northeastern U.S., explains that security is used primarily as a deterrent to store theft. "We can't totally stop the shoplifting or vehicle theft," he says, "but we can try to make stealing less attractive and hope the thieves will move to an easier target."

According to Davis, making a store less desirable to thieves is a costly project. Maintaining a complete complement of TV monitors, personnel, vehicles and communications gear can cost a store over one hundred thousand dollars a year.

Nonetheless, when Black Friday rolls around this year, those costly anti-theft systems will be challenged. Tune in the action with your scanner and discover



Large malls will often use "high tech" security devices to not only monitor the inside of the complex, but the outside area as well.

where your local thieves prefer to do their holiday shopping.

Monitoring the Mini-City

Another stop on our holiday scanner tour allows us to monitor over 150 stores, all at one time. The place: shopping malls. Covering an area of approximately 4 acres, providing parking for over 10,000 cars and handling more then 20,000 shoppers per day, your local mall is actually a city within a city.

One mall supervisor who asked not to be identified agrees. "We have gardens, water falls, grocery stores, pharmacies, spas, restaurants, doctors, dentists, travel agents and even theatres." So when fire starts, or a fight breaks out, it will impact on the entire mall, very quickly."

"Starting on Black Friday and continuing through the holidays," he added, "People pack themselves in here shoulder to shoulder. God help us if an emergency arises and the shoppers start to panic. Heck, even Disney World will close the gates when attendance gets too high. But malls just keep packing them in."

Private Security Guards

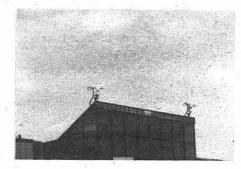
Malls do have private security guards that are hired from a security agency. The agency name is usually on the shoulder patch of the uniform. Once the name of the agency is known, a quick look through a local scanner directory will probably provide an operating frequency.

Uniforms without shoulder patches may indicate that the guards are employed directly by the mall. It is also interesting to note that many of the stores operating within a mall will retain their own private security guards. These frequencies will differ from mall security frequencies. Again, consult your local scanner publications or contact a local scanner club for frequency usage in your area.

Tricks of the Trade

Another way to obtain frequencies is to take your hand held scanner and a

The first hour after a mall closes, security teams will do a walk-through. Some of the hottest radio action may occur at this time.



frequency counter to the mall. Find a cozy seat, plug a set of head phones into your portable and start searching. One of my favorite tricks, as described by Dave Beauvais (Aug MT), is to stand next to a security guard while he is talking on a hand-held. It is an easy and proven way to find those hidden frequencies.

Many of the larger malls also have a security base with a control operator. Internal security uses hand held units and often identify by first name. Mobile units operate in parking areas and usually report as "mobile 1," "mobile 2," and so forth.

Noting the type of antenna that is on the patrol vehicle may provide a clue as to what area of the VHF-UHF spectrum is being utilized. Here is a simple rule to remember. The longer the antenna, the lower the frequency. The smaller the antenna, the higher the frequency. Patrol cars on 500 MHz have short antennas. Vehicles on the low band have a tall antenna. Get the idea?

As with any rule of thumb, there are exceptions. Base or center loaded antennas utilize "coils" that compensate for antenna height. Some manufacturers are actually disguising their antennas, making visual band detection nearly impossible. Here are some additional antenna specifications that may help:

VHF Low

30-50 MHz - 60" to 100" antenna or 35" w/5" coil on bottom.

VHF High

150-174MHz - 18" antenna or 40" w/3" coil on bottom

UHF

450-512MHz- 6" antenna or 32" w/3" coil on bottom.

800 MHz

Cellular - 3" antenna or 18" w/coil in center.

Lastly, if you're still without specific frequencies to monitor, search the following ranges:

154.00 - 155.00 463.00 - 464.00 157.00 - 158.00 464.00 - 465.00

461.00 - 462.00

Monitor the Action: Don't Become a Part of It

Remember, too, that if you do decide to take your valuable scanner equipment to the mall during the holidays, don't forget your common sense. Remember, not only are the shoppers out in full force, but so are the thieves. Put your hand held down for a second and it might be the last time you'll ever see it. The idea is to monitor the action, not become a part of it.

Malls will hold daily special events during the holiday season. These



A city in miniature, where a city's problems may be concentrated under one roof!

shows draw large crowds and place an additional burden on security. If your mall is featuring live bands, chorus groups or talent celebrities, check the security frequencies for increased activity.

If mall security decides to take an interest in your actions, maintain a professional attitude. Keep in mind that many of the security guards are moonlighting police officers. If questioned, be honest and to the point. Security will usually write you off as some sort of "radio nut."

Monitor the police district that surrounds your mall. Special details may be assigned to deter pickpockets and shoplifters. Traffic police will also be increased and portable operations will be at their peak.

When the department stores and malls close down for the evening, don't close down your listening post. In fact, some of the best action may occur within the first hour after closing.

After the doors are locked, security will do a walk through. Each member of the security team is assigned a specific area to search. Radio traffic will remain constant, as the teams look for hidden robbers. Some stores and malls use specially trained police dogs for the same purpose. The dogs may even be allowed to roam the complex through the night. The following morning, about an hour before opening, the animals are removed by a special handler.

The malls of tomorrow will be larger and may even offer apartment rentals. As more people start to take residence in malls, actual miniature cities will develop. While living in one on Black Friday may not appeal to everyone, scanning the action will certainly be exciting. But hurry, the increased radio traffic won't last forever. When Black Friday arrives, there will only be 27 scanning days before Christmas!

430 Garnor Drive Suffield, OH 44260

DXing the Pacific Firestorm

Recent fires in the Pacific Northwest region of the United States have destroyed thousands of acres. It is land that will be barren for years. The process, however, is totally natural. Most of the fires were started by Mother Nature herself: lightning. A few more fires were, of course, caused by arson or carelessly flicked cigarette, but regardless of the cause, the blazes were fought and eventually controlled.

The people who accomplished this herculean task? The USDA. Yes, the United States Department of Agriculture. The USDA has many responsibilities and one of them is protecting our national forests and lands from fire.

I was in northern California during September and I was able to monitor the fire fighting operations directly and examine the equipment used in aircraft operations. The data is presented by a numeric frequency order as utilization of many frequencies were not unique to a given forest or fire operation area. As a basis for my frequency search list I utilized the Government Radio Systems frequency directory from Mobile Resources of San Jose, California.

Of all the frequencies listed, the Forest Net (FN) channels contained the most radio traffic. It was here that logistics and coordination were based for most, if not all operations concerned with the fire fighting operations. The forest nets often dispatched the initial units to possible fires or newly confirmed fires. Logistics ranging from fire crew rotations to meals for the crew evacuation of injured the personnel were monitored. All the FN channels could also be operated in a simplex mode referred to as CH 1. The Fire Camp Service Nets were utilized to coordinate maintenance of fire fighting equipment and other related activities.

The dispatching of aircraft such as air tankers -- both chemical and water -- and helicopters) were monitored on either the USDA North Zone Dispatch channel or on 168.625 USDA aircraft channel (also 415.550 UHF link). Once an air unit was dispatched it could be found operating on most any frequency utilized at a given site.

170.000 was a common air-to-ground frequency. Air tankers also conducted communications in the VHF aircraft band on several frequencies; they were heard on 122.925 working fire zones as well as communicating with their bases. The aircraft-toaircraft frequency of 122,975 provided some interesting observations between pilots.

The UHF frequencies in general repeated the Forest Net channel at each given location and also administration net traffic was heard. The UHF frequencies are fixed links between the various USDA stations (ranger offices and headquarter buildings), but more often than not the links were received when the receiver was dead silent on the respective VHF channel. The links are directional in nature using fixed direction yagi antennas; however, the high mountain antenna locations provided somewhat omni-directional coverage.

The UHF link frequencies listed are the link from the repeater location to the USDA stations. The station to repeater link frequency is exactly four megahertz lower than the listed frequency. Each national forest location used several different UHF link frequencies, with most being between 415.225 and 415.575.

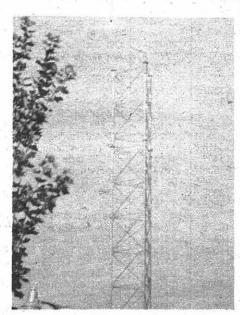
No traffic was monitored on frequencies listed as Boise Cache for either USDA or BLM (Bureau of Land Management, U.S. Department of the Interior) operations.

Beale Air Force Base

Beale AFB is the U.S. Base for SR-71 and U-2 strategic reconnaissance aircraft. It is located near Marysville, California, approximately forty miles northeast of Sacramento.

The 9th SRW (Strategic Reconnaissance Wing) located at Beale provided invaluable assistance to the forest fighting efforts in the state of California with one A U-2R plying a hour training mission on September 3.

The U-2R surveyed more than 64,000 square miles concentrating on remote forest areas and current fire



UHF link at Corning Ranger Station, Mendocino National Forest

zones. The survey produced more than 6,500 feet of exposed film from the mission. The final result was that three previously undetected fires in northern California were found and fire fighting field units were dispatched - all within twenty-four hours of CDFs request for assistance from Beale AFB.

The flight operations can be monitored on SAC command post (CP) frequency of 311.000 (channel 9 nationwide for SAC units) and on the SAC alternate CP frequency of

Aircraft

RD Ranger District THNF Tahoe NF

Mendocino NF

Nationwide

AC

MNF

321.000 (channel 11 nationwide SAC units).

The next Federal File column complete the look at Beale AFB a the 9th SRW operations and pres the radio operations of the U Postal Service. A correction Federal File column in last issue twenty channels listed for UHF operations were for Loring A (Limestone, Maine). Last, certainly not least, thank you to the contributors of data to t column.



USDA air-tanker based at Chester, CA (aircraft based on a C-113); ID "Air-Ta 140"

FIRE FIGHTING FREQUENCIES

	122.850	NW	AIR-TAC 2, AC-AC
1	122.900		AIR-TAC 3, AC to base fields
	122.925		AIR tanker base, operations
	122.975		AC operations, AC-AC
	123.050		Heliport Control
	166.5875R	RW	USDA North Zone Fire Dispatch; WX Reports
	168.100R	NW	USDA Command Ch 2 Fire Fighting Operations
	168.175R		Fire Net CH 4
	168.200		USDA TAC 2, On scene working fine
	168.625	RW	USDA Air Operations
	168.700R		USDA Command CH 1 Fire Fighting, Maintenanc
1	168.775R		Forest Net CH 2
	169.175R		Forest Net CH 2
1	170.000	RW	Air-to-Ground Channel (NBFM)
	170.550R		Forest Net CH 2
	171.500R		Fire Camp Service Net CH 2
	171.525R		Forest Net CH 2
	171.550R		Fire Unit Dispatch (initial)
	171.700R	MNF	Fire Camp Service Net CH 2
1	172.225R	LNF	Forest Net CH 2
	172.425R	TNF	BLM CH 2
	415.225R	RW	Varies (refer to text)
i	415.275R	MNF	HQ, Fire Unit Dispatching
i	415.300R	MNF	Dispatch to AC
	415.325R	RW	Varies
	415.350R	RW	Varies
	415.425R	MNF	RD operations
1	415.475R	PNF	Administration
,	415.525R	PNF	Administration
Ì	415.550R		USDA Air Dispatch (repeats 168.025 & 168.050)
	415.575R		RD Operations
	417.650R	MNF	Repeats Forest CH 2
	419.650R	TNF	Logistic radio traffic
	Key:		
1	ixey.		COMPANY TO THE PROPERTY OF THE

CH

PNF

TNF

Channel

NBFM Narrow Band FM

Plumas NF

Trinity NF

Region Wide

LNF Lassen

National Fores

TAC TACtical

WX Weather

Repeater

516 Kingsley Road SW Vienna, VA 22180

Shaking Out the Mailbag

Calling all low frequency buffs! Marine Radio Station WMH (Baltimore, Maryland) can use your help.

According to the Longwave Club of America, officials at WMH are looking for reception reports on with reception reports of their 428 and 500 kHz transmissions. Hours of operation are from 1100 to 2300 UTC daily, with a CW traffic list at 30-35 minutes past each hour on 500 kHz followed by an immediate QSY to 428 kHz.

Your reception report should include standard information plus an indication of degree of fading and any interference noted. If possible, try to identify the interfering station.

The station guarantees that they'll reply on the same day that your reception report is received. But be sure to include a self-addressed, stamped envelope with your report. Their address:

WMH Marine Radio Station Dundalk Marine Terminal 2700 Brooning Highway Baltimore, MD 21222

Military Dictionaries?

Here's another call for help. Say that you're tuning about the dial and happen upon a military maneuver in Costa Rica. Reception is good, but you just can't seem to make your way through the jargon of foreign military phrases and abbreviations. Where to tune?

As I recall, there were some dictionaries of military terminology in various languages available in French, Spanish, Portuguese and Russian. There may have been a few more in other languages. If anyone has knowledge of a source for these publications which were in the "TM" (Army Training Manual) series, please let me know and I will list the details in a future column. I believe they date back to WWI days.

Think About it!

Take the matter of the "Fairness Doctrine." It has required Radio and TV stations to carry conflicting views on important public issues. Now comes word that the FCC plans to abolish the practice. And a number of congressmen are up in arms. I find this both interesting and confusing. Here's an example of why:

In the case of the Fairness Doctrine, Senator Ernest F. Hollings, (D-SC) went on the record as saying that "the American people own the airwaves." Yet not too awfully long ago, the Electronic Communications Privacy Act made the cellular phone portion of the radio spectrum off limits to the shortwave listener. Are we not also part of the "American People?"

It is difficult to understand how Congress can make such a 180 degree turn on what amounts to the same issue.

Federal Emergency Management Agency

Monitoring Times reader Dave White of Maine raised some points about FEMA communications in a recent letter. As a result, I must admit to an error in identifying the FEMA intercept I made in May 1987 on 3379 kHz. The transmitter was not WGY912, it was WGY908.

In addition to the 10870 kHz frequency reported for WGY912 by Dave, my references show 4780 (night). 16201 and 18744 kHz also assigned to that station. For a more detailed look at FEMA, including listings of frequencies and station locations, I refer readers to the new edition of the Grove Shortwave Directory, due out later this fall.

Quiet U's and K's

I've also been asked how come 'U' and 'K' single letter stations are so quiet these days. The reference is to two of the many single-letter beacons that have been the subject of so many articles -- most recently in the July 1987 MT -- and even more speculation. My observation is that if the assumptions made in the article are in fact correct, then perhaps the locations served by the two beacons have had a very dry August and that might explain the beacon drought.

Straaaaange Station

W.J. Battles of New Hampshire writes to say that "I have found a strange new station operating on 5689 USB sending data and using voice communications with callsigns MOBILE ONE and VERONA LAB TWO. They also used a tactical call of RED LEADER as well as callsign AF3FBF (I believe)."

I could not locate any information regarding these callsigns. Perhaps a reader can identify this station?

Interesting Net

A reader from Oklahoma signing as "Delta Tango" indicates that he (or she?) has been following "an interesting (and bizarre) net on 4373 kHz USB (also rarely on 5210 and 5710 kHz) that spends a great deal of time looking for 'clean alligator playground."

I have also copied this net several times. My impression is that the stations were making reference to a specific operations area when they talked about going to "alligator playground."

The exchanges between operators include questions regarding "Interrogation" which may refer to Radar and Electronic Countermeasures. Use of the term "Papa Uniform" seems to mean a specific location or position given in what appears to be grid system coordinates.

Two aircraft, X-ray Alfa Alfa and X-ray Alfa Bravo were also noted as being part of the operation.

During my most recent intercept of the net, control station Two Whiskey came up on the net and said "HOLD ALL PLAYERS." My guess is that these communications are in connection with US Navy training exercises involving ships that are tracking aircraft.

Special interest Items

3479 kHz 030154Z CW

I believe this net replaced one formerly operating on 3463.6 kHz with not only the frequency changed but an apparent complete callsign change as well with control now using callsign MOA. O/SS are; ALZ, BWU, CAN, CDH, FNE, GND, IDA, ION, JPQ, LFB, MON, NEO, PFO, RSF, SOL (possibly the net collective call), ULP and XKL. There may be others also that Lhave not as yet heard. Some of these stations are very weakly received at the Utility Intrigue monitoring site so I am not absolutely sure I have copied all of the callsigns correctly. Note that the letter "N" in GND and MON is the Spanish NYEH, sent in Morse as MW.

Some of the transmitters sound like little peanut whistles and they drift badly perhaps indicating battery operation or a low powered generator that is not running smoothly.

A typical message heading looks like this:

PBL NR 00181603 GR 30 QTR NR 2055 NR 15 8 87 NR 901 BT (Text of 5-characters per group) BT

The characters appearing in the texts include all the letters from A-Z, Spanish Nyeh, and the figures 2, 3, and 8. Messages are all exactly 30 groups in length. At times traffic flow is very heavy but possibly due to QRM, QRN, weak signals, the passing of traffic can be extremely slow with many repetitions of groups.

At this time I have not come up with a positive identification but I suspect the sponsoring government may be Cuba.

13377.8 kHz 132223Z CW

It took me a moment to realize I was listening to Morse code by voice. Station "A" (quite loud) was sending 5L groups by saying dits and dahs for the characters. The receiving station ("B") was on CW and very weak. Upon completion of the message "B" sent NOTE BT BFHULETEGNUW YSSERA BT." "A" came up on CW and after an exchange of the QSL, QRU, and QRX 2030, "B" sent QTC ALEHWEY with "A" answering NIL NIL GIN HULETEGNA QETTE BT RT RT whereupon "A" shifted to voice and again sent brief chatter by oral Morse code.

The next day at 1942Z I heard FTK DE ADL. There may also have been one other

The next day at 1942Z I heard FTK DE ADL. There may also have been one other station present because I thought I heard FTK called by WSR but just one time. ADL was the strong station and FTK was the weaker station. When contact was established ADL sent: LANITE YISEMAH TTEWAT BE 0500 INDITIGTTA DBILEHAL BLINDLY QSL

MAY 1987 LOGGINGS

KHZ DTOI MODE/IDENTIFICATION/COMMENTS

9			
	2742	080010	USB/YL-EE with 5L grps, Itrs sent in phonetics
	3195	040122	CW/5L grps, vy weak sig, hand sent
	4000	190337	CW/5L grps, slow, auto sent
0	4313	080204	CW/French Naval Freq/French PT & 5L tfc
	4372.4	080148	USB/2WC, 1FO, K5Q/poss tng exercise
	4507.1	120009	CW/00 DE 28, 22 DE 28/poss Soviet acty
	4645.5	080124	CW/Cipher tfc but ltrs sent in string, not possible determine grp length
	4680	130223	CW/841 841 841/5F grps
	5425	150432	CW/KWT99 DE KRH50 (US Emb London) QSY 10733
	6225.8	122309	CW/5L (cut nbrs), auto sent
	6230	200715	CW/Spanish PT msgs/appear be military of official govt in nature
	6243.7	121253	CW/WIO DE DEL (unid)/believed be associated with nets sending the
	0245.7	121233	with Itrs, Spanish Nyeh, plus 2, 3, 8
	6298	020849	
		112359	CW/5L grps, hand sent, very weak sigs
	6518.2	112339	USB/Two OM/SS in cryptic conversation, towards end of contact one
	N 95.	7.3	said he was not going to mess with any bad girls, instead
	0075	100444	he was going to church, ha ha
	6675	160411	CW/5F grps, auto sent, cuts zero as T
	6783.4	122316	USB/YL-EE with 3-2F grps
	6785	221012	CW/5L grps (cut nbrs) auto sent. Also hrd cut nbr tfc on freq
	6700	000704	16 Aug 0408Z
	6789	200731	CW/Spanish PT tfc, military texts
	6840	122318	AM/YL-EE with 3-2F grps. Diff msg frm that on 6783.4 kHz
	7590.3	182354	CW/5L grps, pauses after every 10 grps
	7905	182210	CW/SLB "K", rpts every 4 secs
	13377.7	201729	CW/RGW AUW (cut nbr callup)/foll by 5L (cut nbrs) grps
	13380	132227	CW/KNY32 (Bulgarian Emb, Wash DC) calls LZG7 (MFA, Sofia,
		N	Bulgaria)/PSE QSY 16256/shifts to RTTY 75-170, Bulgarian PT tfc/QSW
	100004	004005	14728 & shifts that freq
	13380.1	301925	CW-AM/Tuning xmtr then YL-EE sending 641 641 641 00000
	13416.8	132019	RTTY 50-425/Romanized Korean text
	13463	171445	CW/5L grps (cut nubrs)/auto sent, slow
	13635.7	061449	CW/Two SLB's here: "C" &n "P"
	13636.6	021315	CW/SLB "F"
	13862.5	- 051630	CW/Hand sent cut nbrs, AU34567DNT for 1-0
	13906.8	141530	Buzz pulses foll by blips with bubbly sound/Sequence not same each
			time and duration of signals varies
	14375.1	201856	RTTY 50-425/msg from MINREX Habana to Cuban Emb Algeria
	14461	201852	CW/5F grps, sent very fast
	14506.9	131528	RTTY 50-170/DE D4B (Sal, Cape Verde) RY
	14638.3	131532	CW/OMZ DE 7L1 (MFA Prague fm Czech Emb, Havana, Cuba)
	14704.8	032014	CW/5L grps (cut nbrs), hand sent, very sloppy fist
	14763.9	161508	CW/5L grps, auto sent, pause after 10 grps, band RTTY QRM on top of
	200	No. of the last of	CW stn
	14848.2	141524	RTTY/Pss PICCOLO transmission
	.19683	021351	CW/Tone on for 2 secs, off for 2 secs, sequence repeats over and over
	19855	021401	CW/Timing pips at one second intervals

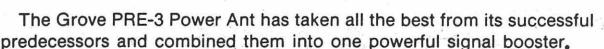
Grove's Indoor SWL Antenna

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\$9.95 (free shipping with PRE-3)

\$7.50 (you specify connector or receiver model; one for each receiver)

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The addition of the Grove Minituner to the ANT 6/PRE-3 combo will allow signal peaking to perfection as well as eliminate intermodulation and image interference on your general coverage receiver.

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ADP-2 F/PL-259 adaptor

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Voyager Celebrates Ten Years of Exploration

With one of its two spacecraft enroute to distant Neptune and the other exploring the outer solar system, the Voyager mission celebrated the 10th anniversary of its launch on August 20, 1987.

During those ten years, Voyagers 1 and 2 have contributed immensely to knowledge of the solar system. Both have logged billions of miles over the past decade, executing flybys of the giant planets Jupiter, Saturn and Uranus. The two unmanned craft have relayed a staggering amount of data on each of the planetary systems, in the process discovering such phenomena as new moons, rings and the first active volcano in space.

Rare Alignment of Planets

The mission was originally conceived in anticipation of a rare alignment of the planets that occurs only once every 170 years. During this alignment, a single spacecraft could visit each of the four planets, using their gravity in a slingshot-like effect.

The Voyagers initially were scheduled only to fly by Jupiter and Saturn, but the initial success of the missions prompted NASA to extend it with flybys of Uranus and Neptune as well.

Voyager 2 was launched August 20, 1977, followed by Voyager 1 on September 5 of that same year. Because of its trajectory, Voyager 1 overtook its twin and arrived first at Jupiter on March 5, 1979. Voyager 1 flew by Saturn on November 12, 1980. Its flight path at that planet then took Voyager 1 up and away from the ecliptic, the plane in which most of the planets orbit the Sun.

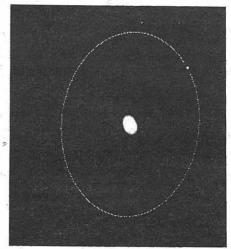
Voyager 2 encountered Jupiter on July 9, 1979 and Saturn on August 25, 1981. It reached Uranus on January 24, 1986.

Mission Highlights

Highlights of the mission at Jupiter include discovery of active volcanoes on Jupiter's moon Io; detailed photos of Jupiter's atmosphere, including the Great Red Spot and the surface of the planet's four major moons; discovery of three new, smaller moons; detection of lightning bolts in Jupiter's upper atmosphere; and discovery of a faint, narrow ring system encircling the planet.

At Saturn, the Voyagers revealed high-resolution details of the planet's new moons and relayed photos of Saturn's larger moons.

During the Uranus flyby, Voyager 2 discovered 10 new moons and



The planet Neptune and its satellite Triton as photographed by Voyager 2 (Triton's orbit is inscribed on the photo) (Courtesy NASA)

offered the first detailed look at the distant planet's ring system. The spacecraft also returned photos of the planet's five largest moons among them Miranda, which scientists agree exhibits the most bizarre geography of any body yet visited in the solar system.

The Voyager project recently released a photo recorded earlier this year by Voyager 2 of Neptune and its moon Triton. With the spacecraft still 853 million miles away from the planet, Neptune and Triton appear as small dots, comparable to the best photos that can be taken by Earth-based telescopes. Successively better photos are expected during the next two years as the spacecraft closes in on the planet.

3.9 Million Miles and Counting

On the anniversaries of their launches, Voyagers 1 and 2 will have traveled a total of 3.9 billion miles and 3.7 billion miles, respectively. After Voyager 2's encounter with Neptune in August 1989, the two spacecraft will continue out of the solar system in search of the heliopause, the outer boundary of the Sun's energy influence.

Both satellites are 10-sided structures that have a diameter of 3.66 meters and a height of .47 meters. Each of the satellites has a mass of 825 kg. On each satellites main frame is a high-gain parabolic reflector and they are powered by three radioisotope thermoelectric generators.

Voyager 1 has two radio downlinks:

2295 MHz (telemetry 9.4 or 28.3 watts) and 8415 MHz (telemetry and tracking, at 12 or 21.3 watts). Voyager 2 uses two downlinks of 2296.48 MHz and 8420.43 MHz. Both satellites use 2113 MHz for uplink telecommand.

The Jet Propulsion Laboratory (JPL) manages the Voyager project for the NASA's Office of Space Science and Applications.

Challenger's Replacement

Rockwell International has begun work on a fifth space shuttle orbiter following the award of a \$1.3-billion contract by NASA on August 1, 1987.

Designated OV-105, the new orbiter will restore NASA's shuttle fleet to four vehicles. OV-105 will replace the shuttle Challenger, which was destroyed early last year in the Mission 51L accident that killed seven crewmembers. Delivery of the new orbiter is scheduled for April, 1991.

Under the terms of the contract, Rockwell will fabricate, assemble, test, check out and deliver the orbiter. Using existing structural spares, the new vehicle will feature the latest upgrades and modifications and will incorporate all new technology evolving from the current return-to-flight activities.

Project NASA

June of 1988 is the proposed date for the shuttle Discovery's launch into space, the first post Challenger launch of an American crew. A lot of attention will be focused on this launch. If my mail is any indication, a lot of MT readers plan on being at the Cape with their scanners and shortwave radios.

Signals from Space is starting a new project to help those that want to monitor space shuttle activities when they resume. I am planning a major update of the shuttle program's radio spectrum in an issue just prior to the launch in June. However I need help in observing any changes in the radio frequency usage at the major NASA shuttle sites, hence 'Project NASA'.

You Can Participate

Those individuals who live close to major NASA installations are asked to help in the project. The sites specifically include: Kennedy Space Center, Cape Canaveral AFS, Patrick AFB, White Sands Missile Range, Vandenberg AFB, Edwards AFB, and Johnson Space Center in Houston.

Monitoring information on the aforementioned sites should include: frequencies (active only), usage, designations (if any), and any call-signs/unit identifications noted on each frequency. The spectrum for

this is unlimited. Information on shortwave networks, VHF/UHF networks, military aircraft frequencies, and satellite links are acceptable for this project. All relevant agencies may also be included, such as USAF, USN, local police and fire departments, amateur repeaters carrying shuttle voice, etc.

Those contributing to the project will get new information as it is entered in the computer. All participants will also be acknowledged unless they request otherwise.

Send your frequency information to:

Project NASA 160 Lester Drive Orange Park, Fl. 32073

Be sure to include your return address to receive new information as it is released. Only contributors to the frequency database will receive updates.

I would like this to be the best update ever done on the shuttle radio networks and I invite our readers to join 'Project NASA' and help MT readers worldwide get ready for the return of America into space in June, 1988.



203 York Place New Lenox, IL 60451

Meet Jack Albert -- RTTY Enthusiast!

Jack Albert thinks RTTY is the roost fun you can have sitting down. And he's excited about sharing his 25+ years of RTTY experience with you. Meet Jack in his first MT column.

A Short Autobiography

I started listening to RTTY in the mid-60's during my high school years. In those days I belonged to the school's amateur radio club. It was here that one of the members introduced me to RTTY. We spent hours copying things like the UPI and AP news wire services using a home built, tube-type terminal unit.

In the late 60's I received my draft notice and I was off to war. The Army sent me to the South East Signal Corp Training Center in Ft. Gordon, Georgia. My classmates were sent to Vietnam. I ended up in Korea where I worked as a "Field Radio Repairman." Later I was transferred to Osan Air Force base in central Korea where I maintained two RTTY sites and spent most of my free time listening to the short wave bands and monitoring RTTY. I got back to the states in 1969 and was discharged the following year.

It wasn't until 1973 that I got back into RTTY. Working at Rockwell International Telecommunications, I started building and designing RTTY equipment in my spare time. Today my equipment consist of an ICOM R-71, a Kenwood 830 and a Sony ICF 2010. There are also piles of homebrew audio filters and a RTTY TU, a Commodore 64 computer with the SWL Text Software by AEA; 80 and 40 meter dipole antennas; 6, 2 and 1/14 meter beams and a Triband beam. RTTY equipment has come a long way since that home brew unit back in high school!

Like our everyday life, microprocessors and computers have changed the shortwave listening hobby. By putting a microprocessor in an RTTY terminal unit (TU) computers actually talk to other computers. Commercial communication systems, too, are also getting more complex. Listen to the shortwave bands and

you'll find a cacophony of strange beeps, clicks and noises -- high speed data transfers -- filling the airwaves. Microprocessors are also making encrypted RTTY more popular and cheaper to build.

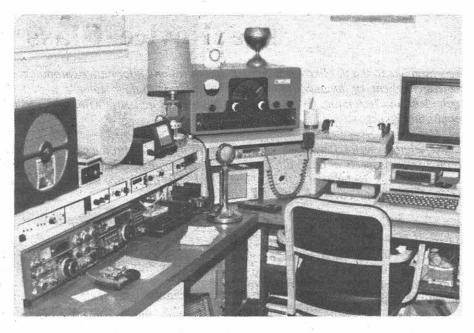
In future issues of *Monitoring Times* I'll try to explain some of these signals and share my experiences as well as the experiences of others. We'll cover all facets of the RTTY hobby from filter construction projects to loggings. You can help by sending in your loggings and any printouts that you may have.

Common Questions

But first, let's take a look at some of the more commonly asked questions about RTTY.

- Where can I find RTTY traffic and what speed are they using?
- How can I tell if the RTTY is encrypted, reversed or what is the baud rate?"
- What am I talking about when I say "encrypted," "reversed," and "baud rate"?
- Why can't I copy RTTY very well with my \$5,000 "Super Trionic" RTTY terminal unit and my \$50 "PEE WEE 6" receiver?
- Why can't I copy RTTY very well with my \$5,0000 "Super Snoop Hyperactive" receiver and my economy model "Cheetum and Howe" mini terminal unit?
- Can you recommend a good receiver or RTTY TU?

I will be happy to answer your questions by mail (if you remember to include a self addressed, stamped envelope). If the question is something I can answer in a future column, you'll find your answer there. I can't promise a product review in every issue because I build most of my RTTY gear but I will try to review any commercial RTTY equipment or software I can get my hands on and report my findings.



Jack Albert's well-equipped monitoring post

Examples of RTTY Copy

Let's take a look at some actual RTTY copy. In figure 1, I took a telex on the 32 meter marine band using the FEC mode. Notice that the print is virtually error free. In figure 2, however, I had obvious difficulty copying an important TELEX from the Coast Guard station NMO to ships traveling to the Mediterranean. Figure 2 is a good example of how an "error free" communications system can be vulnerable to interference on the short wave bands.

The problem was that Coast Guard station NMO was being clobbered by Morse code during fading. And, I couldn't copy the Morse code because it was partially covered by NMO.

Tips and Techniques

You probably would feel that Fig 2 is a poor copy. However I would not have copied anything if I didn't use the proper techniques. In order to pull out anything from this mash of signals, I used the narrow filter (500 Hz) and the Band Pass Tuning on the ICOM R71. I also used the ATC (automatic threshold control) on the

terminal unit.

In future issues I'll show you tech niques to pull out RTTY in these an other problem situations. Then you'l find out how to load it into a file an retrieve it to edit the file using a "tex editor" in your computer. In short I'll take you by the hand and show you how you can add some RTT" "pizazz" to your listening hobby.

If you are a Commodore 64 user will show how to use "GEOS"* to create some very impressive tex using the same RTTY files Because RTTY is vulnerable to errors it is important that you practice "Proof Reading" skills so that you can correct errors. Can you correct the text in Fig 2? Can you find the errors that were caused by the printing of lower case instead of the upper case RTTY characters I'll show you how.

I look forward to sharing my hobby with you and hope you will find tha "Reading RTTY" is one of the mos exciting parts of shortwave listening Until next time! ZCZC

* GEOS is a trademark of Berkele Softworks

COPIED 8-2-87 0500 UTC 8712.6 KHZ 165 HZ SHIFT FEC

Figure 1

BXA 5MPS 5MPS/TOR
7TGY 7TGY 9VRV 9VRV DE WCC WCC WCC
HERES SUMMARY OF HURRICANE ADVISORY NR 42
ARLENE 0400GMT SATURDAY
. 0001/22 5- YROIVD
RCA WCC SHIPTLX
TCAGWE KMIA 220338
HURRICANE ARLENE MARINE ADVISORY NUMBER 42
NATIONAL WEATHER SERVICE MIAMI FL
0400Z SAT AUG 22 QOIU
HURRICANE CENTER LOCATED NEA 36.0N 43.0W AT 22/0400Z.
POSITION WITHIN 60 MILES BASED ON SATELLITE.
PRESENT MOVEMENT TOWARDS THE NORTH OR 350 DEGREES AT 10 KT.
MAX SUSTAINED WINDS 65 KT WITH GUSTS TO 80 KT.
RADIUS 0F 64 KT WINDS 25NE 25SE 25SW 25NW.
RADIUS 0F 50 KT WINDS 50NE 50SE 50SW 50NW.
RADIUS OF 34 KT WINDS 200NE 200SE 175SW 175NW.
RADIUS OF 12 FT SEAS OR HIGHER 200NE 200SE 175SW 175NW.

C DE NMO NMO NMO QLH SITOR QIQEPRCOPIED 8-2-87 0400 UTC 8178 KHZ 145 HZ SHIFT

Figure 2

C SPECIAL WARNING (6) AND THIS PARAGRAPH.
7#4 4-88 8 IA A REBROADCAST OF A SPECIAL WARNING
ND.72 (5070200" AUG 87.
F SPECIAL WARNING NUMBER 2. PERSIAN GULF AND THE STRAIT OF HORMUZ
U.S MARINERS ARE ADVISED TO EXERCISE EXTREME CAUTION WHEN
TRANSITING THE WATERS OF THE
IRIAN GULF, THE STRAIT OF HORMUZ, AND THE GULF NFM,
DUE TO HOSTILITIES BETWEEN
IRAN AND IRAQ MARINERS ARE FURTHER ADVISED TO
AVIOD IRANIAN OR IRAQANI PORTS AND WTL WATERS AND TO
REMAIN OUTSIDE THE AERA DELIMTED PSA GRAPH SW AND 3 BELOW
UNTIL FURTHER NOTICE. IRAN HAS STATED THAT
RCIAN COASTAL WATERS ARE WAR ZONES.
AND TRANSPORTAON OF CARGO TO IRAQIAN PORTS IS FORBIDDEN
A GUIDE FOR THE NAVIGATIONAL SAFETY OF MARINERS
IN THE PERSIAN GULF ARE AS FOLLOWS:
TRASITING THE STRAIT OF HORMUZ, MERCHANT SHIPS ARE SAILING
TO NON-IRAAN PORTS SHOULD PASS 1L U OF AU MUSA ISLAND=
QW MILE SOUTH OF SRREIAND=

The new novice license is attracting would-be "hams" by the thousands. Ike Kerschner reports on what all the excitement is about.

R.D. 1 Box 181-A Kunkletown, PA 18058

The Novice Class Amateur Radio Bands

We would like to thank Mike Mitchell for his eloquent and informative chronology of the development of amateur radio from its infancy through today's high tech equipment and techniques. We hope to see Mike in future issues writing on special monitoring topics.

Ike Kerschner is well known to MT readers for his ability to introduce the newcomer to the various aspects of radio through his previous column, "Getting Started." This month Ike takes the helm of "On the Ham Bands"; let him know what subjects you would like him to cover -- he'll do a great job!

Each mail brings queries about what to expect from the various frequency bands the Novice class amateur is allowed to operate and what equipment is suitable for the newcomer to amateur radio.

For the next several months we will devote this column to examining the many bands and modes the Novice class amateur has to operate with.

HF Novice Bands

The HF (high frequency) band is the region between 3 and 30 MHz in the electromagnetic spectrum. The holder of a Novice license has four frequency bands within this range to work with; they are 3.7 to 3.75 MHz (or 80 meters), 7.1 to 7.15 MHz (40 meters), 21.1 to 21.2 MHz - (15 meters) and 28.1 to 28.5 (10 meters). Each has something of interest to offer the new amateur.

On 80, 40, and 15 meters, the Novice operator is allowed to operate Morse code only. On 10 meters, Morse, radiotelephone and digital techniques are permitted.

Novice operators may also operate on 222.1 to 223.91 MHz (1 1/4 meters), a Very High Frequency (VHF) band, and 1270 to 1295 MHz (23 centimeters), an Ultra High Frequency (UHF) band. On these bands the Novice class licensee can operate all modes allowed his higher class brethren.

Usually, equipment designed for the HF bands will cover all of the HF bands while VHF and UHF operation require separate equipment. Therefore this month our discussion will be confined to the HF Novice bands.

80 Meters (3.7 to 3.75 MHz)

Eighty meters has always been a popular band with newcomers for several reasons. First, for those who like to build their own equipment 80 is the easiest band of all to get a home brew station to work on. The diligent home builder can assemble a station for this band with easily available parts at very low cost. It is difficult to describe the pleasure of talking to friends thousands of miles away with a rig you have built yourself (try it!).

If building is not your cup of tea it is possible to purchase a decent used transmitter for 80 at very reasonable prices (I have obtained working 80 meter transmitters for less than ten dollars. Add another 50 to 60 bucks for a decent receiver and you are on the air.

Second, while daylight conditions limit useful communications to about 200 miles, nighttime extends ranges to several thousand miles. Often on a

quiet fall or winter evening stations halfway around the globe will be workable.

Third, thousands of new Novices inhabit this band and code speeds are reasonable. This makes 80 a good place to improve your operating skills, In addition, scores of older, more experienced hams like to hang out on the 80 meter Novice band and chew the fat with the newcomers and help them advance in the hobby.

Fourth, moderate power levels of 25 to 50 watts will let you work nearly anything you can hear on this band. Power levels of under ten watts are usable, but I suggest sticking to at least 25 watts to make life easier.

One disadvantage of 80 meters is the length of antenna required. A quarter wave antenna is 64 feet and a half wave is 128 feet. Of course it is not necessary to have a perfect antenna and simple wires or loaded dipoles will do a good job for you. One friend runs his 50 watt transmitter into a 25 foot long wire and has excellent results on 80. So don't be afraid to try short antennas.

While summer static at times timits the usefulness of 80, some contacts can be made every day by the average station. Average being the 25 to 50 watt power level described; good days are more frequent than bad days this band.

The Novice is allowed Morse only on

40 Meters (7.1 to 7.15 Mhz)

Another Morse-only band for the Novice, 40 meters will easily extend your range to 400 + miles during daylight. After dark the Novice portion of this band suffers from heavy interference from SWBC stations, making communication difficult on part of the band. Coast to coast and DX contacts are easy on 40 after sunset.

The same transmitter and receiver you use for 80 will work well on 40. Antennas for 40 are half the size of an 80 meter antenna.

15 Meters (21.1 to 21.2 MHz)

Again Morse only for the Novice, 15 is the super DX band. During the hours of daylight, stations all over the globe can be worked here. Normally this band closes for DX after sunset and only local contacts are possible (during good conditions 15 meters is open 24 hours a day, though).

Again shoot for at least 25 watts on this band and 50 or more is better.

There is a lot of competition for the DX stations that inhabit 15 so it is a good idea to have some experience on 80 or 40 before tackling 21 MHz.

Antennas for 15 are only 22 feet for a half wave dipole, but be advised that horizontal dipoles do not work well on this band. Any vertical antenna mounted as high as possible will do fine on 15. A better choice would be a uni-directional Yagi or Quad antenna.

Equipment for 15 is a bit more sophisticated than your 80/40 meter rig. Transmitters have at least one additional stage and receivers must have good sensitivity, stability and selectivity. Expect to pay more for a rig that will do a good job on 15; say 100 to 150 bucks up for a used unit.

10 Meters (28.1 to 28.5 MHz)

At last a band where the Novice can operate radiotelephone (voice) as well as Morse code or teletype! Phone and teletype privileges on ten meters have attracted thousands of newcomers to amateur radio.

Until the Novice was permitted ten meters, this band closed down after dark during normal conditions; for most purposes it could be said ten was dead after dark. That's no longer the case. Large numbers of Novice operators keep this band hopping around the clock and it is possible to find a contact at anytime on ten meters today.

Like 15 meters, 10 is normally a daytime DX band. During the present portion of the sunspot cycle good daytime openings are rare with only an occasional South American station or a European or two showing up from time to time. However with the number of folks on this band they have plenty of contacts to keep them interested. Contacts of 50 to 500 miles are possible every day.

A station for ten meters that includes the capability of SSB phone operation will cost about \$200.00 up for used gear and from \$400.00 up for new.

Antennas are quite small on ten with a half wave being only 16 feet in length. As with 15, horizontal dipole antennas are not satisfactory and simple vertical antennas will do much better for you. Again the Yagi or quad is the preferred antenna on 10.

Next month we will discuss some of the gear available to the Novice (new and used), and take a look at some simple antennas you can build for the HF bands.

Equipment Notes

Three examples of used transmitters available to the Novice interested in operating the HF bands are the Heath DX-20, the Heath DX-40, and the Johnson Ranger. All cover 80 through 10 meters and allow CW operation. The Ranger and DX-40 have AM phone capability but are not legal for Novice use.

Expect to pay from \$5.00 to 30.00 for a DX-20 and up to \$40.00 for the DX-40. A Ranger in good condition will cost up to \$100.00.

Both Heath units use either crystals or an external VFO (Variable Frequency Oscillator). The Ranger has a built-in VFO plus provision to use crystals if you desire.

The prices I mention for 80 and 40 meter gear are approximately what older tube type rigs are selling for. As additional bands are added to the rig you must expect to pay more for a decent unit. The inclusion of SSB phone will at least double the price of any ready-built unit.

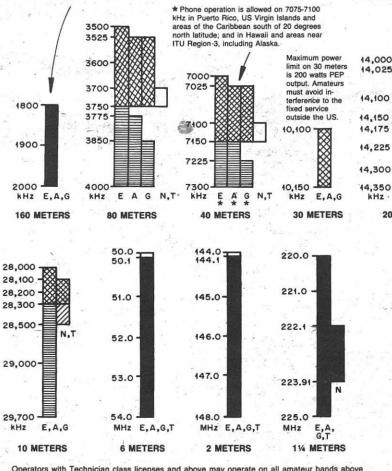
Prices for new gear start at about \$350.00 for a suitable ready built Morse only transceiver. An all band SSB/CW rig starts at about \$600.00.

CONVENTION CALENDAR Date Location Club/Contact Person West TX ARC/ Otis Brasfiled KA5REM Nov 7-8 Odessa, TX 3103 N. Hancock, Odessa, TX 79762 Allen Co Am RTC/ Alan Scott N9BAC P.O. Box 278, Huntertown, IN 46748 Radio Central ARC/ Andy Geldman WB2FXN Nov 8 Ft Wayne, IN Nov 8 Selden, NY 3 Walton Way, Tanglewood, NY 11727 Montgomery ARC/ John McLemore c/o WCOV-TV 1369 Adrian La., Montgomery AL 36196 III State Conv/ James Miller W4JR Nov 14-15 Montgomery, AL Rockford, IL Nov 15 5581 Einor Ave, Rockford, IL 61108 S.Fla Sec Conv/ Frank Ziegler K4EUK 8316 Stillbrook, Tampa, FL 33615 Palm Bch Rptr Assoc/ Hamfest Nov 20-22 St.Petrsbrg,FL Nov 21-22 Palm Beach, FL P.O. Box 461, Lake Worth, FL 33460 Dec 4-6 Apache Jct, AZ Superstition ARC/ Billy Glaze 7809 E. Javalina, Mesa, AZ 85208 Okeechobee ARC/ Tim Taylor N4AOU 401 SW Park St., Okeechobee, FL 33474 Dec 5 Okeechobee, FL Dec 5 Banning, CA Banning Police Dept/ Dennis Paul Decker (714) 849-6966 MONITORING TIMES IS HAPPY TO RUN ANNOUNCEMENTS OF RADIO EVENTS OPEN TO OUR READERS. Send your announcement at least 60 days before the event to: Monitoring Times Convention Calendar, P.O. Box 98, Brasstown, NC 28902.

US AMATEUR BANDS

(Courtesy QST magazine)

ateur stations operating at 1900-2000 kHz must not se harmful interference to the radiolocation service and afforded no protection from radiolocation operations;



Operators with Technician class licenses and above may operate on all amateur bands above 50 MHz.

COMPUTERS RADIO dication State-of-the

Try a subscription to Ham Radio Magazine for one year for just \$19.95. SAVE \$3 off the regular Han Radio subscription rate of \$22.95 and \$10 off the newsstand price.

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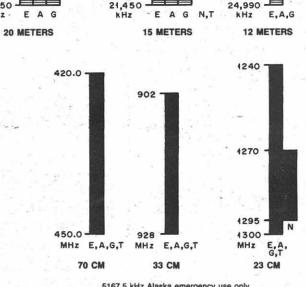


ham radio magazine, Dept. MT, Greenville, NH 03048

avoid interference to the fixed service outside the US.

24,890

24,930



5167.5 kHz Alaska emerge (SSB only) E, A, G, T, N

US AMATEUR POWER LIMITS

At all times, transmitter power should be kept down to that necessary to carry out the desired communications. Power is rated in watts PEP output. Unless otherwise stated, the maximum power output is 1500 W. Power for all license classes is limited to 200 W in the 10,100-10,150 kHz band and in all Novice subbands below 28,100 kHz. Novices and Technicians are restricted to 200 W in the 28,100-28,500 kHz subband. In addition, Novices are restricted to 25 W in the 222.1-223.91 MHz subband and 5 W in the 1270-1295 MHz subband.

CW, VOICE, SSTV, FAX

CW, VOICE, SSTV AND FAX

= CW AND RTTY

= CW ONLY

 \otimes

E = EXTRA A = ADVANCED G = GENERAL T = TECHNICIAN

N = NOVICE

3132 SE Irvingham Topeka, KS 66605

Back to Basics and ... Hello, winter DX!

Yes, I've returned to Kansas and to teaching high school journalism and English, as well as to entirely different DX conditions. More about those after I have a chance to DX a little more extensively.

Getting Back to Basics

I think it's time also that we returned to the roots of DXing. You see, I'm one of those iconoclasts who believe that SW, FM, TV, and ute DX are all Johnny-come-latelies in the hobby -- fun, noble, and interesting, but still not as challenging as AM DX. what could be more challenging than DXing on a receiver which uses no electricity, AC or DC? I'm talking about the crystal set, of course, and decent DX is indeed possible on one. Just ask Ray Cole of Cape Girardeau, MO.

Ray put together a crystal detector last year from designs made by Barfield, Lyon, and Tuggle, adding a 168' longwire 40' high. Using a germanium diode in his set (for that modern touch!), he was able to log stations in Quebec, Cuba, Mexico, Netherlands Antilles, San Antonio, Des Moines, and Denver. All this was on the very first week he tried it out.

Mike Tuggle, who lives in Virginia, has logged some 600 stations over the years using *only* a crystal set! What's more, he's having fun doing it, and that's the important part of the hobby. If you're not having fun, you should take up something else to keep yourself

Dozens of crystal set designs have been published over the years, but I've decided to include one published in 1923 in the "Pre-phy-lac-tic [toothpaste] Handy Book for Boys". It seems to have been designed to utilize a round oatmeal box, which the Quaker Company has thoughtfully continued to provide.

Other more modern designs are available and have been published quite often in the hobby magazines, but I thought that some of you purists might want to try out one of the earlier designs. Let me know if you decide to build it and what results you get. And don't ask me how it works; a technician I ain't!

No Stereo Standard for U.S.

As of this writing the FCC has not designated a stereo standard for United States AM stations, unlike Australia, Brazil, Canada, and possibly others who have chosen Motorola's C-Quam system. Only slightly over 500 AM stations are currently broadcasting in stereo, with others apparently holding back to see which system will get the nod from the FCC. Very few home, portable, and auto receivers are currently equipped to receive any AM stereo, and I don't know of any auto receiver priced under \$200 which is AM stereo capable. It's no wonder that consumers are barely aware of the existence of AM stereo.

November = Good AM DX

In November, DX activity on AM is on the rise. you live east of the Mississippi, start checking split frequencies for trans-Atlantic stations just before sunset, and you'll be amazed at the hets you'll be able to hear while the sun is still shining. DX'ers living south and east of Kansas City will have their best chance to start bagging Caribbean and South American stations early in the evening, roughly from sunset to two or three hours later. Those living west of Denver will want to get up early in the morning, around 3:30 am PST, for a shot at trans-Pacific DX. Trans-polar DX such as Kvitsoy, Norway-1314 becomes easier for DXers living in the upper midwest states. And on good nights, anything can happen! Don't forget daytime DX as a chance to fatten up your DX totals. From now through around Valentine's Day is a good time to listen on quiet frequencies for regional stations whose signals rise above atmospheric noise. Also, if you use a good directional antenna to null out those locals and near locals, you may be surprised at what can be heard behind them. With T-storms at a lull, those faint signals will now be audible.

DXing the Graveyard

Real gluttons for punishment inhabit the graveyard frequencies (1230, 1240, 1340, 1400, and 1490) now for maximum counts on those frequencies. Again, a good directional antenna, especially an amplified box loop, or a phased array, may prove to be your best DX Be prepared to sit on a frequency for an entire evening, though, to be able to gather enough informa-tion to verify stations. You may find your best time for DX'ing graveyarders after midnight when some stations in smaller markets sign off for the night, leaving the frequency more clear for others to come in. You should be able to pick out at least a half-dozen different GY's on a good night as they rise to the top of the noise.

AM DX Tips

I've noted one local off the air in Topeka - WREN-1250 but I haven't had the time to find out just why. Southwestern DX'ers who hear hard rock on 550 just before CST signoff time are almost certainly listening to KFRM-550, which simulcasts KICT, Wichita. Look for new stations on clear frequencies, according to NRC's Jerry Starr, in 1040 from Flemington, NJ (4700/1000 day.night watta, directional antenna) and Delmar, NY (5000/1000 directional) (maybe the Cuban powerhouse will clear off 1040 by then); and on 1160 from Fieldale, VA at 5000/250 directional).

TV DX

Don't forget to scan the UHF TV frequencies for new low-power stations which pop on unannounced. I've noted one locally on 21 rebroadcasting the TBN, originating from 40 in Orange county, CA. Ironically, the first time I tuned by I caught a personality praying for an end to the technical difficulties which apparently had kept the station off the air.

E Skip

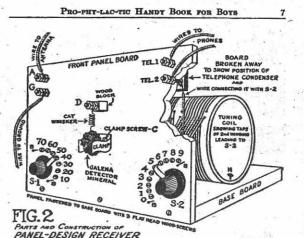
December is usually the month when for some reason E-skip returns for a short time to low-band VHF TV channels, but remember that last year an incredible tropo opening occurred right after Thanksgiving, with a duct enhancing station signals for over a thousand Check conditions several times a day if you

I'd like to present a few FM and TV changes ... but unfortunately they're still boxed up somewhere in my spare room, or I think they are. Perhaps I'll find them by the next deadline (oops, my deadline list is missing, too). Isn't moving fun? 73 until next time!

PRO-PHY-LAC-TIC HANDY BOOK FOR BOYS HOW TO MAKE A GOOD RADIOPHONE RECEIVER

The Tuning Coil (Fig. 1)
mall holes in Cardboard Tube 1/2
Use 1/2 lb. Spool No. 22, double coil
read and through holes

m Tooth Never Decays

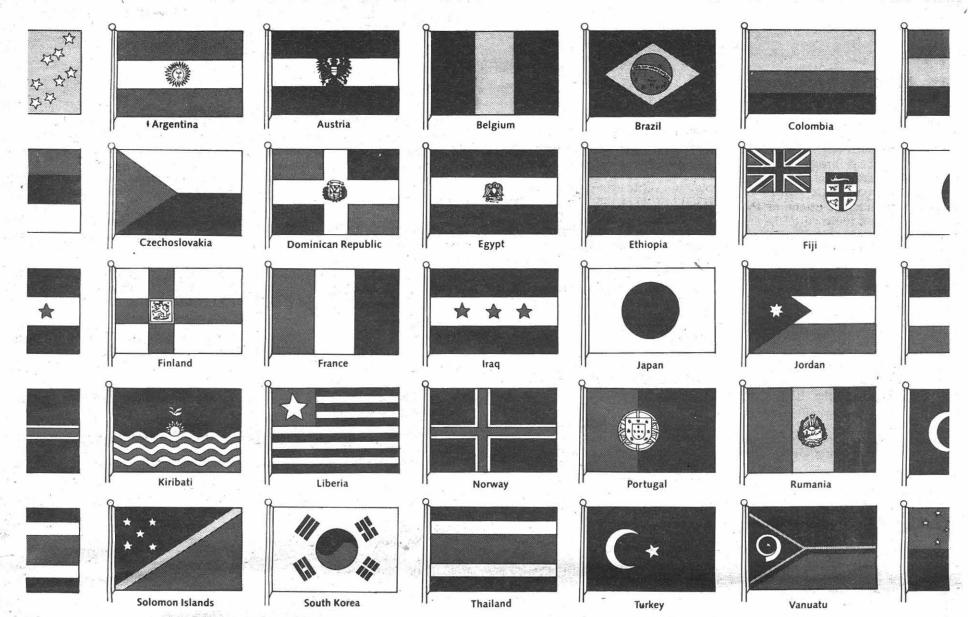


PRO-PHY-LAC-TIC HANDY BOOK FOR BOYS

The Antenna wire, 75 to 100 ft lo above ground, and

To Operate

MONITORING TIMES



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Synchronous detection circuitry is a tiny mechanism with global proportions. It locks onto the frequency you've chosen and travels with it, letting you clearly hear one country at a time, with less interference all of the time. Which means if you happen to be listening to Ping-Pong from Peking, São Paulo soccer shouldn't break in.

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Radio NewYork International

On August 27 all charges were dropped against those responsible for Radio New York International. The station received national attention in July because of its broadcasts from international waters near New York City. Although the FCC vowed to prosecute "to the full extent of the law" if the station returned to the air, chief engineer Alan Weiner made good on his intention to resume broadcasting.

Unanswered Questions

Although RNI's legal battles are over at least for now, the case has raised several disturbing issues. Why was New York's Village Voice reporter R. L. Smith not permitted to show his press credentlals and why was he arrested along with the RNI staff? Why did the FCC deliberately destroy, rather than simply confiscate RNI's transmitting equipment before the case went to court and any guilt established?

According to our reader John Demmitt, the FCC also seized reception reports and other mail sent to RNI. Since the FCC ultimately asked that the charges be dropped, was the confiscation of mail simply an attempt to intimidate listeners of pirate broadcasts? Finally we might note that in the 1950's some VOA broadcasts were regularly made from the "U.S.S. Courier," stationed in international waters in the Mediterranean.

Does that make the United States government a pirate?

Several of our readers were able to log RNI. Minnesota's Mace Twigg heard them on both 1620 and 6240 kHz. He reports a friend in Louisana logged them on 1620. New Jersey's Tom Lemaire heard their final broadcast on July 27 on both 1620 and 6240 but was unable to receive their 103.1 FM signal. New York's Cathy Turner also heard them on 1620 and 6240 but could not receive the FM transmission. In addition to RNI, Cathy has recent loggings of Radio North Coast International on 7448 and unidentified pirates on 7415 and 7463.

Cuba

The radio war continues. John Demmitt writes to tell us that September 2 (EDT) Cuba once again fired up the 300 kW transmitter on 1040 kHz, drowning out WHO Des Moines at his central Pennsylvania location. He also noticed stations on 1160 dropping carrier in mid-sentence, perhaps a result of the FCC taking field measurements.

Demmitt says a July 22 Radio Taino broadcast on 1160 was cancelled after the State Department threatened Cuba with a military strike if the broadcast took place. Interestingly enough nothing was said about 1040.

Guatemala

If you are fortunate enough to log that relatively new anti-Guatemalan government clandestine on 6950 UTC Saturdays at 0015, you might be able to verify your reception via NISGUA, 1314 14th Street, NW, Washington, DC 20005. This organization, Network for Solidarity with the People of Guatemala, has been verifying some reports, although it is not actually responsible for the broadcasts. English reports are fine, but enclosing a prepared card would be a good idea.

Nicaragua

Reporting in the by-invitation-only newsletter *DX South Florida*, Terry Krueger notes a new anti-Sandinista clandestine, Radio Liberacion Onda Corta, on 5890 kHz. The station appears to sign on at about 0145 UTC, and its programming is not parallel with that of Radio Liberacion on 1520. At present it is not clear whether this station is intended to replace existing Contra shortwave efforts or is a new adddition.

Radio Caroline

For those on the East Coast an excellent DX challenge as we approach the winter season is to try to log Radio Caroline. It broadcasts on 963 kHz, and with less power on 558. Caroline transmits from the "S.S. Ross Revenge" off the Southeast coast of England. On rare occasions it has been heard in North America.

While I was in England several months ago, I found it quite easy to monitor Caroline's transmissions, although it is technically illegal to listen to them. The 558 service is a popular pops and rock format running approximately from 6:00 a.m. to midnight British time. Dutch language Radio Monique, with pops and rock, occupies 963 until 6:00 p.m. when it is replaced with "Viewpoint 963", which airs religious programming (mostly American) until 9:15 or 9:30 p.m.

In talking with people in both England and the Netherlands I was told that both Radio Caroline and Radio Monique have wide followings. However, Caroline appears to have trouble raising advertising revenue, except for its religious programming. About the only advertising heard is for the Canadian lottery. Atari and several other prominent companies advertise on Monique which seems to have a far greater number of advertisers.

The other offshore pirate, Laser 576, is off the air, perhaps permanently. According to the British government and others this is the result of financial difficulties. However, the station claims it is due to renovation of its ship, which is being done in France.

Thanks to England's David Duck-Worth, Scott McClellan, and New York's Dave Alpert for information on the offshore pirates. And now...

NUMBERS STUFF

Welcome to the Havana Moon segment of "The Outer Limits." S.M. of Humberside, England, bought a copy of *Uno, Dos, Cuatro* and was kind enough to forward revealing "German numbers" information.

S.M. says the "German numbers" station that I have reported on 3820 kHz utilizes the following frequencies and times: 3215 kHz at 1800, 1900, 2000, and 2100 UTC. On 3280 kHz (with same traffic as 3215 kHz) at 2000, 2100, 2200 and 2300 UTC. And on 5820 kHz at 1200 and 1300 UTC. Also on 6450 kHz at 0800 and 0900 UTC.

A Florida monitor from Boca Raton says the 3820 kHz transmission at 2200 UTC is often in excess of S9! Could this be a relay transmission from Havana, S.M.?

S.M. also states that--in the manner of their "Spanish numbers" kin(?)-- "German Numbers" stations repeat traffic for days, weeks and even months at a time. Some traffic is years old.

Perhaps all "numbers" stations are "kindred spirits," S.M.!

According to S.M., the "Gypsy Music Station" is Rumanian! This station can be heard on 5425 kHz at 2000, 2100, 2200, and 2300 UTC and 6825 at 1800 and 2300 UTC. Note that 6825 and 5425 kHz are active "Spanish numbers" frequencies!"

The usual format for this "Gypsy Music" station: tune, repeat tune, "OM" with "Terminat," tune, repeat tune. "Terminat," etc. with carrier off in 12 or 13 minutes. Traffic seldom heard.

Thanks for the report. Let's hear more from you and your colleagues in England.

Ever notice that "numbers" stations reveal while they conceal and conceal while they reveal! Think about it!

K.C. of Maryland writes that shortly before 0400 UTC on 21 July he monitored an extremely strong carrier on 7021.7 kHz. At 0400 a series of numbers were transmitted in Morse and repeated over and over for several minutes. The code, according to K.C., was perfectly sent therefore machine or computer generated.

This Maryland contributor says that after "introduction," random number groups were transmitted and repeated. Carrier was continuous--that is--did not turn on and off in time to the Morse transmission. Transmission ended 0424 UTC.

K.C. says that he is not certain that the carrier was from the same transmitter as the Morse. He says that the "fading pattern" would suggest that two transmitters were used! Maybe these guys have had lessons from the 5-digit Spanish crowd, K.C.! This was the loudest signal K.C. he had ever heard on the amateur bands. The signal peaked at more than plus 50 and faded to a low of plus 20!

K.C. is of the opinion the effect of this ORM was to obliterate all legitimate traffic on or about the frequency in use.

Yes, K.C. this transmission was illegal! But for the ARRL to take the matter to the FCC is another story! I seem to remember someone from the ARRL once saying that they (the ARRL) had never had any "numbers" interference complaints!

And the "spectrum police," our very own FCC (according to a spokesperson), says the FCC has never had a "numbers" complaint!

Consider this an official complaint, FCC!

K.C. wonders if this transmission was in any way related to the Cuban medium wave incident of the same night. Dr. Santosuosso has previously reported on this matter.

Reading List

"Spycatcher" by Peter Wright (Viking). Thatcher and MI-5 (the British of the FBI) are worried. Thatcher's government moved to halt publications and won a controversial ruling by England's highest court banning newspapers from reporting the contents of "Spycatcher!"

Be sure to obtain Guide to Utility Stations by J. Klingenfuss.

Noticias

Next issue: Revealing -- and possibly never before published -- "German number" information!

Watch for future announcements of another far more revealing *Uno*, *Dos*, *Cuatro* project. Work progresses!

Don't miss one action packed minute of "The Fourth Protocol" (Lorimar). Pay particular attention to the Radio Moscow transmission. You do remember Radio Free Granada's obituaries, don't you?

Wanted

Al Smith, Vivian H., Fred Lehman, Tammy Bakker, Kevin O'Connell, John Blair, Bill Neill, R.L. Slattery, Bob Homuth, Michele Schute, Bob Russ, Mary Minard and Bruce M. All were once readers and contributors. Some even acquired *Uno, Dos, Cuatro*. It would be nice to hear from you again!

"Buena Suerte Amigos."

LEGEND:

- The first four digits of an entry are the broadcast start time in UTC.
- The second four digits represent the end time. In the space between the end time and the station name is the broadcast schedule.

S=Sunday M=MondayT=Tuesday W=Wednesday H=Thursday F=Friday A=Saturday

If there is no entry, the broadcasts are heard daily. If, for example, there is an entry of "M," the broadcast would be heard only on Mondays. An entry of "M,W,F" would mean Mondays, Wednesdays and Fridays only. "M-F" would mean Mondays through Fridays. "TEN" indicates a tentative schedule and "TES" a test transmission.

The last entry on a line is the frequency. Codes here include "SSB" which indicates a Single Sideband transmission, and "v" for a frequency that varies.

We suggest that you begin with the lower frequencies that a station is broadcasting on and work your way up the dial. Remember that there is no guarantee that a station will be audible on any given day. Reception conditions can change rapidly, though, and if it is not audible one night, it may well be an another.

month.

All frequencies in this list have been heard by one or more Monitoring Times monitors during the previous

	()			
0100 UTC	[9:00 PM EDT/6:00 PM PDT	Ŋ	0200-0300 0200-0300 0200-0300	Armed Forces Radio and TV CBC Northern Quebec Service. HCJB, Ecuador
0100-0115 0100-0120 0100-0124	Vatican Radio RAI, Italy Kol Israel	6150, 9605 6010, 9575 7465, 9435 9855	0200-0300	KVOH, California
0100-0130	HCJB, Ecuador	9875, 11775 11910, 15155	0200-0300	Radio Cairo, Egypt Radio Havana Cuba
0100-0130	Radio Canada International	9535, 11845 11940		Radio Moscow, U.S.S.R
0100-0150	Deutsche Welle, West Germa			
0100-0200 0100-0200	Armed Forces Radio and TV. BBC, England		0200-0300	RAE, Argentina Voice of America
0100-0200 0100-0200 0100-0200 0100-0200 0100-0200 0100-0200 0100-0200 T-A	CBC Northern Quebec Srve CFCX, Montreal, Canada CFRX, Toronto, Canada CFVP, Calgary, Canada CHNX, Halifax, Canada CKFX, Vancouver, Canada KVOH, California Radio Australia	6195, 9625 6005 6070 6030 6130 6080 9495 15160, 15320 15395, 17715 17750, 17795	0200-0300 0200-0300 0200-0300 0200-0300 0200-0300 0200-0300 0215-0300	Voice of Free China, Taiwan. WC9N, Boston, Mass WHRI, Indiana WRNO Worldwide WYFR, Florida Radio Berlin International
0100-0200 0100-0200	Radio Canada International Radio Havana Cuba	5960 6090	0300 UTC	[11:00 PM EDT/8:00 PM
0100-0200	Radio Moscow	5940, 6000 6070, 6170 7115, 713 7150, 7290 7400, 9530 12050, 1360	0300-0310 0300-0315 W,A 0300-0325	CBC Northern Quebec Service. Radio Budapest Radio Netherland

0000 UT		•	0100-0200 0100-0200	Armed Forces Radio and TV BBC, England	9565 6030, 1534 5975, 600 6120, 617 7325, 951	0200-0300	RAE, ArgentinaVoice of America	12050, 136 15425 9690, 117 5995, 61
0000-0030 0000-0030 0000-0030 0000-0045 0000-0045	Radio Canada International Radio New Zealand Int'l	7465, 946 9855 5975, 600 6120, 617 7325, 941 9515, 956 9915, 1119 5960, 976 6080, 976	5 0100-0200 0100-0200 0 0100-0200 0 0100-0200 5 0100-0200 5 0100-0200	CBC Northern Quebec Srve CFCX, Montreal, Canada CFRX, Toronto, Canada CFVP, Calgary, Canada CHNX, Halifax, Canada CKFX, Vancouver, Canada KVOH, California Radio Australia	9590, 991 6195, 962 6005 6070 6030 6130 6080 9495 15160, 1532	55 0200-0300 0200-0300 0200-0300 0200-0300 0200-0300 0215-0300	Voice of Free China, Taiwan. WC9N, Boston, Mass WHRI, Indiana WRNO Worldwide WYFR, Florida Radio Berlin International	9455, 98 9650, 97 5985 9815 9850 7355 9555, 96 6080
0000-0045 0000-0100 0000-0100 0000-0100 0000-0100	WYFR, Florida Armed Forces Radio and TV. CBC Northern Quebec Svce. CFCX, Montreal, Canada CFRX, Toronto, Canada	6195, 962 6005 6070		Radio Canada International Radio Havana Cuba Radio Moscow	15395, 1771 17750, 1779 5960 6090 5940, 600	0300 UTC	[11:00 PM EDT/8:00 PM	/ PDT]
0000-0100 0000-0100 0000-0100 0000-0100 0000-0100	CFVP, Calgary, Canada CHNX, Halifax, Canada CKFX, Vancouver, Canada KVOH, California Radio Australia	6030 6130 6080 17775 15320, 1539			6070, 617 7115, 713 7150, 729 7400, 953 12050, 1360	0300-0310 0300-0315 W,A 0300-0325	CBC Northern Quebec Service Radio Budapest Radio Netherland BBC, England	6. 6195, 96 6025 6020, 61 9590, 117 5975, 60
0000-0100 0000-0100 0000-0100 0000-0100	Radio Baghdad, Iraq Radio Beijing,China Radio Havana Cuba Radio Moscow	15140, 1779 11705 15445 6090 5940, 600	0100-0200 0100-0200	Radio Moscow World Service Radio Prague, Czechoslovakia Spanish Foreign Radio, Spain	15245, 1542 17685, 1788 5930, 605 7345 9630, 1188	55	CN STATE OF THE ST	6120, 61 6195, 71 7325, 95 9600, 99
		6170, 711 7135, 715 7290, 740 12050, 1360	5 0100-0200 0 0	Voice of America	5995, 613 7205, 945 9650, 977 9815, 1158	0300-0330 0300-0330 0300-0345 0300-0350	Radio Cairo, Egypt Radio Kiev, Ukrain SSR Radio Berlin International Deutsche Welle, West Germany	9475, 96 7260, 71 9560, 96 y 6010, 60 9700
0000-0100 0000-0100 0000-0100 - 0000-0100	Radio Moscow World Serv Radio Sofia Bulgaria Spanish Foreign Radio, Spain Voice of America	9700 9630, 1188 5995, 6130, 945	0100-0200 0100-0200	WCSN, Boston, Mass WHRI, Indiana WRNO Worldwide WYFR, Florida	11740, 1520 9765 9850 7355 9555	0300-0400 0300-0400 0300-0400 0300-0400 0300-0400	Armed Forces Radio and TV CFCX, Montreal, Canada CFRX, Toronto, Canada CFVP, Calgary, Canada CHNX, Halifax, Canada	6030 6005 6070 6030 6130
		9650, 977 9815, 1158 11695, 1174 15205	0 0130-0140	Radio Berlin International Voice of Greece HCJB, Ecuador	6080 7430, 939 9420 9875, 1177	0300-0400 0300-0400	CKFX, Vancouver, Canada HCJB, Ecuador	6080 6205, 98 11775
0000-0100 0000-0100 0000-0100 0030-0100	WCSN, Boston, MA WHRI, Indiana WRNO Worldwide BBC, England	9765 11770 7355 5975, 600		Radio Austria Internațional.	15155 9550	0300-0400 T-A 0300-0400 0300-0400 0300-0400	KVOH, California Radio Havana Cuba Radio Japan Radio Moscow	9495 6090 5960 5940, 60
		6120, 617 7325, 951 9590, 991	5	[10:00 PM EDT/7:00 P	M PDI]			7115, 7° 7165, 7° 7400
0030-0100	HCJB, Ecuador	9875, 1177 11910, 1515		Radio France Int'l	5950, 605 9790	0300-0400	Radio Prague, Czechoslovakia Trans World Radio, Bonaire	5980, 7
0030-0100 0030-0100	Radio Belize Radio Kiev, Ukrain SSR	3285 7260, 720 7185, 1178	0200-0230	BBC, England	5975, 600 6120, 617 7325, 951	5 0300-0400	Voice of Free China, Taiwan.	9535 6035, 7; 9550, 9; 5985
0030-0100 S 0030-0100 T 0045-0100	-A Radio Portugal Radio Berlin International	13645, 1518 5960, 975 9680 6080	0200-0230	Kol Israel	9590, 991 7465, 943 9855 6025	0300-0400 0300-0400 0313-0400	WCSN, Boston, Mass WRNO Worldwide Radio France International	9815 7355 6055, 7 7175, 9
0050-0100	Vatican Radio	6105, 960 11780	5 0200-0230 0200-0250 0200-0256	Swiss Radio International Deutsche Welle, W. Germany. Radio RSA, South Africa	5965, 613 9725, 988 7285 6010, 961	0330-0400	BBC, England Radio Yerevan, Armenian SSR	9800 5975

The MT Monitoring Team

Rich Foerster, NE

Greg Jordan, NC

6030, 153 6195, 96 6205, 98

6195, 6205, 11775 9495 17795 11745 5990, 9475, 6090 5940,

Joe Hanlon, PA

frequency

0400 UTC	[12:00 PM EDT/9:00 PM PDT	1	0600-0700	Voice of America	6035, 6090, 7325,	6080 6125 9530	1000 UTC	[6:00 AM EDT/3:00 AM	PDT]	
0400-0430 0400-0430 0400-0430 0400-0500 0400-0500 0400-0500 0400-0500 0400-0500 0400-0500	BBC, London, England 5975, 6195, 9600 Swiss Radio International 6135 Trans World Radio, Bonaire 9535 Armed Forces Radio and TV 6030 CBC Northern Quebec Service. 6195, CFCX, Montreal, Canada 6005 CFRX, Toronto, Canada 6070 CFVP, Calgary, Canada 6030 CHNX, Halifax, Canada 6130	6175 9410 9625	0600-0700 0600-0700 S 0615-0630 0630-0700 0645-0700	WHRI, Indiana WRNO Worldwide Radio Canada International Radio Tirana Radio Canada Intrnationa	9540, 9635 6100, 6185 6140 9500 6140	9550	1000-1030 1000-1100 1000-1100 1000-1100 1000-1100 1000-1100 1030-1100 1030-1100	Radio Australia ABC, Perth, Australia AFRTS BBC, London CFRX, Toronto, Canada HCJB, Quito, Ecuador Radio Australia Radio Netherland	9700 9750, 12095 6070 6130 9580,	953 976 977 965
0400-0500 0400-0500	CKFX, Vancouver, Canada 6080 HCJB, Ecuador 6205,	9875	0700 UTC	[3:00 AM EDT/12:00 /	AM PD1]			-H	
0400-0500 0400-0500	Radio Havana Cuba	6090 7150 9490	0700-0730	BBC, London	5975, 7120,	6195 7150	-	95		
0400-0500	Radio New Zealand	30.4	2.5		7185, 9600, 11860	9410 9640	1100 UTC	[7:00 AM EDT/4:00 AM	PDT]	
0400-0500 0400-0500 0400-0500	Radio Sofia Bulgaria 7115 RAE, Argentina 9690 Voice of America 5995, 7280,	6035 9550	0700-0730 0700-0800	Radio Australia HCJB	5995, 6130, 9845,	9655 9745 11925.	1100-1125	Radio France Int'l, Paris	9790, 1 11690, 1 15365, 1	1184
0400-0500 0400-0500 0400-0500 0400-0500	Voice of Turkey	3330	0700-0800 0700-0800 0700-0800 0700-0800 0700-0800 S	Radio Moscow	11835 7290 5985 7365 6100, 6185	7400	1100-1125 1100-1130 1100-1130	Radio Netherland HCJB, Ecuador Radio Australia	6130, 1 5995, 7215,	958 977
0400-0500 0430-0500	WYFR, Florida	6195 9600	0700-0800 0700-0800	WSZO, Marsall Island WYFR, Florida	4940 6065, 9660, 11580	7355 9680	1100-1130 1100-1130 1100-1200 1100-1200 1100-1200	Radio Japan General Service. Voice of America ABC, Perth, Australia AFRTS BBC, London	6120 9760 9610 6030, 5965,	970 619
0500 UTC	[1:00 AM EDT/10:00 PM PDT]	1	304 304 315	were the second at the second	46.00	erro kazar s	1100-1200	CFCX, Montreal, Canada		ors)
0500-0510 0500-0530	CBC Northern Quebec Service 8195 5976 6005, 6190, 9510,	5 6155 7160 9600	0800 UTC 0800-0825 M-F 0800-0825 0800-0830	BRT, BelgiumRadio Netherlands	9880 9630, 6130,	9715 9745	1100-1200 1100-1200 1100-1200 1100-1200 1100-1200 1100-1200 1100-1200	CFRX, Toronto, Canada CFVP, Calgary, Canada CHNX, Halifax, Canada CKFX, Vancouver, Canada KYOI, Saipan Radio Beijing Radio Moscow	6070 6030 6130 6080 11900 11855 13755, 1	1522
0500-0530 S,M 0500-0550 0500-0600 0500-0600 0500-0600 0500-0600 0500-0600	Trans World Radio, Bonaire 9535 Deutsche Welle	6130	0800-0835 S 0800-0900	FEBA, Seychelles BBC, London	9845, 11925 15115 7150, 9600, 11860,	9410 9640 12095	1115-1200 1130-1200 1130-1200	TWR, Bonaire HCJB, Quito, Ecuador Radio Australia	6080,	60 72 97
0500-0600	HCJB, Quito, Ecuador 6205, 11775	9875	0800-0900	Radio Australia	5995, 9580, 11720	6080 9655	1145-1200	Radio Berlin Intl	15240	
0500-0600 0500-0600	Radio Havana Cuba	6090 7150	0800-0900 0830-0900	RTE Portugal HCJB, Quito, Ecuador	9670 6130, 11925	9745				
0500-0600 0500-0600	Spanish Foreign Radio 6125 Voice of America 5995,	6030	0830-0900	Swiss Radio International	9560, 11905,	9885 15570	1200 UTC	[8:00 AM EDT/5:00 AM	PDT]	
0500-0600 0500-0600 0500-0600 S 0500-0600	WCSN, Boston, Mass		noon UTC	[5:00 AM EDT/2:00 A	M PDT		1200-1215 M-A 1200-1225 1200-1230	Vatican Radio Radio Netherland Radio Australia	17865, 2 15560, 1 5995,	2148 1760 606
0300-0000	With, Florida		0900 UTC	[3:00 AW ED1/2:00 A	W PDI				6080, 7215,	720 958 977
0600 UTC	[2:00 AM EST/11:00 PM PST]		0900-0915	BBC, London	9410, 12095, 15400, 17575,	15070 17790 21485	1200-1230 1200-1230 1200-1242 1200-1300	Radio Berlin Intl Radio Tashkent Trans World Radio Bonaire ABC, Wanneroo, Australia	15240 7325 11815 9610	51,
0600-0645 0600-0700	9660, BBC, London	7355 9680 7150	0900-0930 0900-1000 0900-1000 0900-1000	AFRTS Deutsche Welle HCJB, Quito, Ecuador	9580, 9710, 6030 9720 6130,	9655 11720 9745	1200-1300	AFRTS	6030, 9700, 1 6195, 11775, 1	951 1209
0600-0700 0600-0700 0600-0700 0600-0700 0600-0700 0600-0700	CFCX, Montreal, Canada	9600 9845 11775	0915-1000 0930-1000	BBC, London	11925 11750 9580, 9710	9655	1200-1300 1200-1300 1200-1300 1200-1300 1200-1300 1200-1300	CFCX, Montreal, Canada CFRX, Toronto, Canada CFVP, Calgary, Canada CHNX, Halifax, Canada CKFX, Vancouver, Canada HCJB, Quito, Ecuador	15070, 1 17790 6005 6070 6030 6130 6080 11740, 1	



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- Keyboard frequency entry
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All-Band All-Mode Receiver Covers 100 kHz-30 MHz (108-174 MHz with VC-20 option)

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Service manual Special Introductory Price...\$749.95 order: SMR5000 price: \$25.00

DESK TOP CONT.

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- CR-64: High stability oscillator
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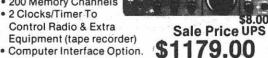
 4 KHz filter replaces stock. 6 KHz wide filter—
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RD6: YAESU FRG8800

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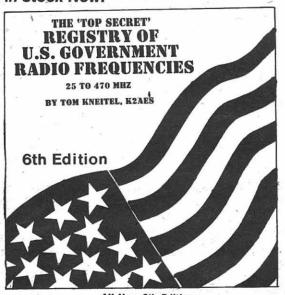


frequency

					.5			
1200-1200	Radio Moscow	9600, 13680, 13710 13755, 15155 15225, 15375 15560, 17645	1400-1500 1430-1500 1430-1500	WYFR, USA Radio Finland Radio Netherland	9680, 11830 11945, 15400 11735, 13770 15560	1700-1800 1700-1800 1700-1800	CKFX, Vancouver, Canada CKZU, Vancouver, Canada Radio Moscow	9490, 962 9765, 988
1200-1300	WHRI, Indiana	17820 5995, 11790				1700-1800	Voice of America	11840, 1375 15410, 1544
1200-1300 1200-1256	WYFR, USA	9680 9645, 9665	1500 UTC	[11:00 AM EDT/8:00 A	MA DOTI	ec 9		15580, 1560 17785, 1780
1230-1300	Radio Austria International	11855 15320	1300 010	[11.00 AW ED1/8:00 A	AWI PDI]	1700-1800 1700-1800	WCSN, Massachusetts WHRI, Indiana	17870 15225 15105
3			1500-1530	HCJB, Quito, Ecuador	11740, 15115 17890	1700-1800 1700-1800	WRNO Worldwide WYFR, Florida	11965 11580, 1183
1300 UTC	[9:00 AM EDT/6:00 AM	PDT]	1500-1530 1500-1550	Radio Netherland Deutsche Welle	13770 21600	1745-1800	BBC, London	9410, 1209 15070, 1540
300-1330	BBC, London	6195, 9510	1500-1556 1500-1600	Radio RSA, South Africa	17825, 21590 9700, 15330		1	30 Tes
	DDO, CONGON	11775, 12095 15070, 17705	1500-1600	BBC, London	15430 11750, 12095	1800 UTC	[2:00 PM EDT/11:00 A	M PDT]
		17780, 17790 18080, 21970	1500-1600 A,S	BBC, London	15070, 15400 15420 11775, 15260		5 . 6	47000
300-1330	Radio Australia	5995, 6060 7205, 9580	1500-1600 1500-1600	CBC Northern Quebec Service CFCX, Montreal, Canada	e. 9625, 11720 6005	1800-1830 1800-1830	Radio Canada International Radio Prague, Czechoslovakia	
300-1330 300-1330 S	Radio Finland Radio Norway International.	15400, 11945 15310	1500-1600 1500-1600	CFRX, Toronto, Canada CFVP, Calgary, Canada	6070 6030	1800-1900 1800-1900	AFRTS BBC, London	15330, 1543 9410, 1209 15070, 1540
300-1337 A-S 330-1355 S	TWR, Bonaire	11815 11945, 15400	1500-1600 1500-1600	CKFX, Vancouver, Canada CHNX, Halifax, Canada	6080 6130	1800-1900 1800-1900	CBC, N. Quebec Service CFCX, Montreal, Canada	9625, 1172 6005
300-1400 300-1400	ABC Waneroo, Australia	9610 9700, 15430	1500-1600 1500-1600 S	Radio Australia	9580 9625, 11720	1800-1900 1800-1900	CFRX, Toronto, Canada CFVP, Calgary, Canada	6070 6030
300-1400 300-1400	CFCX, Montreal, Canada CFRX, Toronto, Canada	6005 6070	1500-1600	Radio Japan General Service	11955, 15440 21700	1800-1900 1800-1900	CKFX, Vancouver, Canada CKZU, Vancouver	6080 6160
300-1400 300-1400	CFVP, Calgary, Canada CHNX, Halifax, Canada	6030 6130	1500-1600	Radio Moscow	11840, 13680 13755, 15375	1800-1900	Radio Moscow	9625, 976 9825, 988
300-1400 300-1400 300-1400	CKFX, Vancouver, Canada CKZU, Vancouver, Canada	6080 6160		- and the behave sets	15420, 15475 15545	1800-1900	Radio Kuwait	11840 11665
300-1400 S	HCJB, Quito, Ecuador Radio Canada Int'l	11740, 15115 17890 9625, 11855	1500-1600 1500-1600	Voice of America WYFR, Florida	15205 9680, 15375	1800-1900	Voice of America	11760, 1541 15580, 1560
300-1400	Radio Korea	9625, 11855 15440, 17820 15575	1515-1600 1530-1600	Radio Berlin International Radio Yugoslavia	15240 15240			17785, 1780 17870
300-1400	Radio Moscow	11840, 13755 15375	1530-1600	Swiss Radio International	15430, 17830	1800-1900 1800-1900	WCSN, Boston, Mass WMLK, Bethel, PA	21515 9455
300-1400 300-1400	Radio RSA, South Africa WHRI, Indianapolis	21590 11790	4	and the property of the the		1800-1900 1800-1900	WRNO Worldwide	15420 11580, 1183
300-1400 330-1400	WYFR, USA	9680 12095, 15070	1600 UTC	[12:00 PM EDT/9:00 A	AM PDT]	1830-1900 1830-1900 A,S	Swiss Radio International Radio Canada International	9885 17820
330-1355 M-A 330-1400	BRT, Belgium Radio Australia	15590 9580	1600-1630	Radio Sweden Int'I	15235	1830-1900	Radio Netherlands	9540, 1760 21685
330-1400 330-1400	Radio Berlin International.	17880 15570, 17830	1600-1640 1600-1700	UAE Radio	11730, 15320 15330, 15430	1830-1900 1830-1900	Spanish Foreign Radio Radio Havana Cuba	15375 11795
330-1400	U.A.E. Radio	15435, 17865 21605	1600-1700	BBC, London	11775, 12095 15070, 15260	1,75		
			1600-1700	CFCX, Montreal, Canada	15400 6005	1900 UTC	[3:00 PM EDT/12:00 P	M PDT]
400 UTC	[10:00 AM EDT/7:00 AM	M PDT]	1600-1700 1600-1700	CHNX, Halifax, Canada CFRX, Toronto, Canada	6130 6070	1900-1925	Radio Netherland	9540, 1760
1 7 1			1600-1700 1600-1700	CFVP, Calgary, Canada CKFX, Vancouver, Canada	6030 6080	1900-1930	Spanish Foreign Radio	21685 15375
100-1415 100-1430	Radio Berlin International Radio Australia	17880 9580	1600-1700 1600-1700	Radio France International. Radio Moscow	11705, 17620 9765, 11840	1900-2000 1900-2000	AFRTSBBC, London	15330, 1543 9410, 951
00-1430 00-1430 S	Radio Finland Radio Norway International.	11945, 15400 15245, 15310	1600-1700	Voice of America	13755, 15205 15410, 15580	1900-2000	CBC Northern Quebec Serv	15070
100-1430 100-1430	R.Stn Peace & Progress USSR Radio Sweden International.	15345			15600, 17785 17800, 17870	1900-2000 1900-2000	CFCX, Montreal, Canada CFRX, Toronto, Canada	6005 6070
100-1500 100-1500	ABC Perth, Australia	9610 9700, 15330	1600-1700 1600-1700	WHRI, Indiana WRNO Worldwide	15105 11965	1900-2000	CFVP, Calgary, Canada CKFX, Vancouver, Canada	6030 6080
100-1500 A,S	BBC, London	15430 9510, 11775	1600-1700 1630-1700	WYFR, Florida Radio Netherland	11830 13700, 15570	1900-2000 1900-2000 1900-2000	CKZU, Vancouver, Canada HCJB, Ecuador	6160 17790
100-1500	BBC, London	12095, 15070 17790			nesativi i i i da i 19. oktobrili i ili	1900-2000 1900-2000	Radio Havana Cuba Radio Kuwait	11795 11665
100-1500 100-1500	CBC Northern Quebec Service CFCX, Montreal, Canada	6005	1700 UTC	[1:00 PM EDT/10:00 A	AM PDT]	1900-2000	Radio Moscow	9720, 976 9825, 1184
100-1500 100-1500	CFRX, Toronto, Canada CFVP, Calgary, Canada CHNX, Halifax, Canada	6070 6030		1 0.62.000	. 15% v	1900-1957 1900-2000	Radio Prague, Czechoslovakia Voice of America	15155 9760, 1176
100-1500 100-1500	CKFX, Vancouver, Canada	6130 6080	1700-1730 1700-1730 S	Radio Netherlands Radio Norway International.	13700, 15570 15310			15410, 1544 15580, 1778
00-1500	HCJB, Quito, Ecuador	11740, 15115 17890	1700-1730 1700-1745	Swiss Radio International BBC, England	9535 9410, 11775	1900-2000	WCSN, Boston, Mass	17800, 1787 21515
00-1500 S	Radio Canada International.	9625, 11720 11955, 15440			12095, 15070 15260, 15400	1900-2000 1900-2000 1900-2000	WMLK, Bethel, PA WRNO Worldwide	9455 15420
100-1500	Radio Moscow	11840, 13680 13755, 15225	1700-1800	AFRTS	15330, 15430 17880	1900-2000 1930-2000	WYFR, Okeechobee, Florida Radio Bucharest, Romania	11830 9690, 1194
		15320, 15375 15470, 15475	1700-1800 1700-1800	CBC, N. Quebec, Canada CFCX, Montreal, Canada	9625 6005	1930-1955 1930-2000	Radio Finland Radio Sofia Bulgaria	11755 9700, 1172
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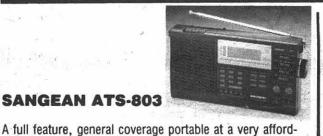
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2000-2100 2000-2100 2000-2100 2000-2100	CBC Northern Quebec Svc CFCX, Montreal, Canada CFRX, Toronto, Canada CFVP, Calgary, Canada	9625, 11720 6005 6070 6030	2100-2200 2100-2200v 2100-2200	KVOH, California Radio Jamahiriya, Libya Radio Moscow	7400,	7115 9735 1840	2300-0000 2300-0000 2300-0000	Radio Japan 1 Radio Moscow, U.S.S.R	11800 6170, 7135,	71 ⁻ 74(
2000-2100 2000-2100 2000-2100 2000-2100	CHNX, Halifax, Canada CKFX, Vancouver, Canada CKZV, Canada Radio Moscow	6130 6080 6160 9720, 9765	2100-2200	Voice of America	6045, 11760, 1 15410, 1 15580, 1	9760 5220 5445 7720	2300-0000 2300-0000 2300-0000 2300-0000	Radio Moscow World Service 1 Voice of Turkey WCSN, Boston, Mass WHRI, Indiana	7685, 9560 9465 1770	
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2005-2100 2015-2100 2030-2100	Radio Damascus Syria Radio Cairo, Egypt Radio Netherland	11625, 12085 9670 9540, 9715	2130-2200 2130-2200 2130-2200	HCJB, Quito, Ecuador Radio Canada International.	15270, 1	7790 7130 5325	2200 UTC	[6:00 PM EDT/3:00 PM I	PDT]	
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2100 UTC	[5:00 PM EDT/2:00 PM	PDT]	2300 UTC	[7:00 PM EDT/4:00 PM	PDT]		2200-2225 2205-2225 2200-2225 2200-2230	Vatican Radio	6015, 5990, 9910.	9615 971 1162 1172
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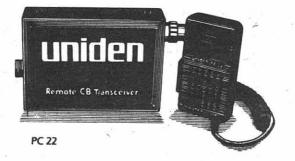
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Time and Frequency Standard Stations Worldwide

To the shortwave listener, WWV (Fort Collins, Colorado), WWVH (Kauai, Hawaii) and CHU (Ottawa, Ontario) have become synonymous with time and frequency calibration. But unknown to the majority of listeners, dozens of similar stations may be heard with favorable propagation from all points of the globe.

This month MT takes a look at all of these stations whose primary

purpose is to provide standard frequency and/or time reference for its users, most often military and government interests. It is additionally useful for the listener as a propagation indicator for reception quality from different parts of the earth.

The list below is compiled from the July 1986 edition of the U.S. Army MARS Field Manual FM 11-490-7.

Station	Location Latitude Longitude	Frequency (kHz)	Schedule (UT)	Form of the Time Signals
BSF	Taiwan Rep. of China	5000	Between min 00-05, 10-15, 20-25, 30-35, 40-45, 50-55 from 0100-0900	Second pulses of 5 ms duration, Minute marker is pulse of 300 ms duration: During 29th and 59th min., Morse code and Chinese voice announcement of time. Second markers for DUT1 are pulses of 100 ms.
СНИ	Ottawa Canada +45°18' +75°45'	3330 7335 14670	continuous	Second pulses of 300 cycles of a 1 kHz modulation. Minute pulses are 0.5 s long. A bilingual (FrEng.) announcement of time is made each minute. DUT1: CCIR code-by split pulses
DAM	Elmshorn Germany, F.R. +53°46' - 9°40'	8638.5 16980.4 4625 8638.5 6475.5 12763.5	11 h 55 m to 12 h 6m 23 h 55 m to 24 h 6 m from 21 Sept. to 20 March 23 h 55 m to 24 h 6 m from 21 March to 20 Sept.	New international system, then Second pulses from minutes 0.5 to 6.0 (Minute pulses prolonged). A1 type. DUT1: CCIR code by doubling after Minute pulses 1 to 5
DAN	Osterloog Germany, F.R. +53°38' - 7°12'	2614	11 h 55 m to 12 h 6 m 23 h 55 m to 24 h 6 m	As DAM (see above)
DAO	Kiel Germany, F.R. +54°26' -10° 8'	2775	11 h 55 m to 12 h 6 m 23 h 55 m to 24 h 6 m	As DAM (see above)
DCF77	Mainflingen German, F.R. +50° 1' - 9° 0'	77.5	continuous, except second Tuesday of every month from 4 h to 8 h	The Second marks are reduction to 1/4 of the carrier's amplitude of 0.1 s duration; the reference point is the beginning of the pulse modulation. The second 59 marker is omitted. DUT1: CCIR code by lengthening to 0.2 s
DGI	Oranienburg Germ. Dem. Rep. +52°48' -13°24'	185	5 h 59 m 30 s to 6 h 00 m 11 h 59 m 30 s to 12 h 00 m 17 h 59 m 30 s to 18 h 00 m	A2 type Second pulses of 0.1 s duration for seconds 30-40, 45-50, 55-60. The last pulse is prolonged.
DIZ	Nauen Germ. Dem. Rep. +52°39' -12°55'	4525	continuous except from 8 h 15 m to 9 h 45 m for maintenance if necessary	A1 type Second pulses of 0.1 s duration. Minute pulses prolonget to 0.5 s. Hour pulses marked by prolonged pulses for seconds 58, 59, 60. DUT1: CCIR code by double pulse.
FFH	Chevannes France +48°32' - 2°27'	2500	continuous from 8 h to 16 h 25 except Saturday and Sunday	Second pulses of 5 cycles of 1 kHz modulation. Minute pulses prolonged to 0.5 s. DUT1: CCIR code by lengthening to 0.1 s.
FTA91	Saint-Andre-de- Corcy France +45°55' - 4°55'	91.15	at 8 h, 9 h, 9 h 30 m, 13 h, 20 h, 21 h, 22 h 30 m.	Al type Second pulses during the 5 minutes preceding the indicated times. Minute pulses are prolonged. DUT1: in Morse code.
FTH42 FTK77 FTN87	Pontoise France +40° 4' - 2° 7'	7428 10775 13873	at 9 h and 21 h at 8 h and 20 h at 9 h 30 m, 13 h, 22 h, 30 m.	Al type Second pulses during the 5 minutes preceding the indicated times. Minute pulses are prolonged. DUT1: in Morse code.

Station	Location Latitude Longitude	Frequency (kHz)	Schedule (UT)	Form of the Time Signals
GBR	Rugby United Kingdom +52°22' + 1°11'	16	at 3 h, 9 h, 15 h, 21 h	Al type Second pulses during the 5 minutes preceding the indicated times. DUT1: CCIR code by double pulse
нвс	Prangins Switzerland +46°24' - 6°15'	75	Continuous	Interruption of the carrier at the beginning of each second, during 100 ms. The minutes are identified by a double pulse, the hours by a triple pulse. No transmission of DUT1.
IAM	Rome Italy +41°52' -12°27'	5000	10 m every 15 m from 7 h 30 m to 8 h 30 m and from 13 h to 14 h except Saturday afternoon and Sunday Advanced by 1-hour in summer.	Second pulses of 5 cycles of 1 kHz modulation. Minute pulses of 20 cycles (Announcements and 1 kHz modulation, 5 m before the emission of time signals).
IBF	Torino Italy +45° 2' - 7°42'	5000	During 15 m preceding 7 h, 9 h, 10 h, 11 h, 12 h, 13 h, 14h, 15 h, 16 h, 17 h, 18 h. Advanced by 1-hour in summer.	Second pules of 5 cycles of 1 kHz modulation. These pulses are repeated 7 times at the minute. Voice announcement at the beginning and end of each emission. DUT1: CCIR code by double pulse
JG2AE	Koganei Japan →35°42′ -139°31′	8000	from 20 h 59 m to 10 h 59 m.	Second pulses of 1600 Hz modu- lation. Minute pulses are preceded by a 600 Hz modulation. DUT1: CCIR code by lengthening
JG2AS	Chiba Japan + 35°38' -140° 4'	40	from 23 h 30 m to 8 h (exc. sunday) and from 8 h to 23 h 30 on Monday. Interruptions during communications.	Al type Second pulses of 0.5 sec. duration. Second 59 is omitted. No DUT1 code.
JJY	Koganei Japan • 35°42' -139°31'	2500 5000 10000 15000	continuous, except inter- ruptions between minutes 25 and 34.	Second pulses of 8 cycles of 1600 Hz modulation. Minute pulses are preceded by a 600 Hz modulation. DUT1: CCIR code by lengthening
LOLI	Buenos-Aires Argentina -34°37' +58°21'	5000 10000 10000	11 h to 12 h, 14 h to 15 h, 17 h to 18 h, 20 h to 21 h 23 h to 24 h	Second pulses of 5 cycles of 1000 Hz modulation. Second 59 is omitted. Announcement of hours and minutes every 5 minutes, followed by 3 m of 1000 Hz and 440 Hz modulation. DUT1: CCIR code by lengthening
LOL2 LOL3	Buenos-Aires Argentina -34°37' +58°21'	8030 17180	1 h, 13 h, 21 h	Al Second pulses during the 5 minutes preceding the indicated times. Minute pulses are prolonged. DUT1: CCIR code by lengthening
LQB9	Planta Gral Pacheco Argentina -34°26' +58°37'	8167.5 17551.5	22 h 5 m, 23 h 50 m 10 h 5 m, 11 h 50 m	Al Second pulses during the 5 minutes preceding the indicated times. Second 59 is omitted, second 60 is prolonged. After the emission, OK is transmitted if the emission is correct, NV if not correct. DUT1: CCIR code by omission of second markers.
MSF	Rughy United Kingdom +52°22' + 1°11'	60 ~	continuous except for an interruption for maintenance from 10 h 0 m to 14 h 0 m on the first Tuesday in each month.	Interruptions of the carrier of 100 ms for the Second pulses, of 500 ms for the minute pulses. The signal is given by the beginning of the interruption. DUT1: CCIR code by double pulse
MSF	Rugby United Kingdom +52°22' + 1°11'	2500 5000 10000	between minutes 0 and 5, 10 and 15, 20 and 25, 30 and 35, 40 and 45, 50 and 55	Second pulses of 5 cycles of 1 kHz modulation. Minute pulses are prolonged. DUT1: CCIR code by double pulse
NBA	Balboa USA • 9° 3' •79°39'	24 147.85 5448.5 11080 17697.5	Every even hour except 24 h and during Monday maintenance (12 h to 18 h) 5 h, 11 h, 17 h, 23 h	Experimental FSK Second pulses on 24 kHz. CW Second pulses during the 5 minutes preceding the indicated times on the American Code time format. DUTL: by Morse Code, each minute between seconds 56 and 59.
NDT	Yosami Japan + 34°58' -137° 1'	17.4	to be determined	To be determined.
NPG	San Francisco USA + 38° 6' +122°16'	3268 6428.5 9277.5 12966	6 h, 12 h, 18 h, 24 h	CW Second pulses during 5 min- utes preceding the indicated times on the American Code time format DUT1: by Morse Code, each min- ute between seconds 56 and 59.

Station	Location Latitude Longitude	Frequency (kHz)	Schedule (UT)	Form of the Time Signals
NPM -	Honolulu USA • 21°25' •158° 9'	- 4525 9050 13655 16457.5 22593	6 h. 12 h, 18 h, 24 h	CW Second pulses during 5 min- utes preceding the indicated times on the American Code time forma DUT1: by Morse Code, each min- ute between seconds 56 and 59.
NPN	Guam USA + 13°27' -144°43'	4955 8150 13380 15925 21760	6 h, 12 h, 18 h, 24 h	CW Second pulses during 5 min- utes preceding the indicated times on the American Code time forms DUT1: by Morse Code, each min- ute between seconds 56 and 59.
NSS	Annapolis USA •38°59' •76°27'	21.4		Experimental FSK Second pulses on 21.4 kHz when transmissions resume.
	116-21	88 5870 8090 12135 16180	5 h, 11 h, 17 h, 23 h (on Tuesday 17 h the frequency 185 kHz replaces 88 kHz)	('W Second pulses during 5 min- utes preceding the indicated times on the American Code time forms
	alloring as	20225 25590	17.h, 23 h	DUT1: by Morse Code, each min- ute between seconds 56 and 59.
NWC	Exmouth Australia - 21°49' -114° 9'	22.3	Keyed from 28 to 30 min- utes after every other even hour beginning 0 h UT	Experimental FSK Second pulses during the indicated times on the American Code time format. DUT1: by Morese Code, between seconds 56 and 58.
OLB5	Podebrady Czechoslovakia +50° 9' -15° 8'	3170	continuous except from 5 h to 11 h on the first Wednesday of every month	A1 type, Second pulses No transmission of DUT1
OMA	Liblice Czechoslovakia +50° 4' -14°53'	50	continuous except from 5 h to 11 h on the first Wednesday of every month	Interruption of the carrier of 100 ms at the beginning of every second, of 500 ms at the beginning of every minute. The precise time is given by the beginning of
		2500	between minutes 5 and 15 25 and 30, 35 and 40, 50 and 60 of every hour except from 5 h to 11 h on the first Wednesday of every month	the interruption. Pulses of 5 cycles of 1 kHz modu- lation (prolonged for the minutes) The first pulse of the 5th minute is prolonged to 500 cycles. No transmission of DUTI.
PPE	Rio de Janeiro Brazil -22°54' +43°13'	8721	0 h 30 m 11 h 30 m, 13 h 30 m, 19 h 30 m, 20 h 30 m, 23 h 30 m	Second ticks, of A1 type, during the 5 minutes preceding the in- dicated hours. The minute ticks are longer. DUTI: CCIR Code by double puls
PPR	Rio de Janeiro Brazil -22°59' +43°11'	435 8634 13105 17194.4	01 h 30 m, 14 h 30 m, 21 h 30 m	Second ticks, Al type, during the 5 minutes preceding the indicated hours. The minute ticks are longer
RAT	Moscow USSR +55°19' -38°41'	2500	between minutes 30 and 35, 41 and 45, 50 and 60 from 17 h 50 m to 24 h	Second pulses* at the beginning of the minute are prolonged to 0.5 s.
7	-30 11	5000	between minutes 30 and 35, 41 and 45, 50 and 60 from 1 h 30 m to 17 h	DUT1 • dUT1 by Morse Code each hour between minutes 11 and 12.
RBU	Moscow USSR +55°19' -38°41'	66-2/3	between minutes 0 and 5 from 0 h to 22 h 5 m	Al type. Second pulses*. The pulses at beginning of the minute are prolonged to 0.5 s. DUT1 + dUT1: by Morse Code each hour between minutes 6 and 7.
RCH	Tashkent USSR +41°19' -69°15'	2500	between minutes 15 and 20; 25 and 30, 35 and 40, 45 and 50 from 0 h to 3 h 50 m from 5 h 35 m to 9 h 30 m from 10 h 15 m to 13 h 30 m from 14 h 15 m to 24 h	Second pulses*. The pulses at the beginning of the minute are prolonged to 0.5 s. DUT1 + dUT1: by Morse Code each hour between minutes 51 and 52.
RID	Irkutsk USSR + 52°46' -103°39'	5004	between minutes 5 and 10, 15 and 20, 25 and 30, 51 and 60 from 0 h to 1 h 10 m	Second pulses*. The pulses at the beginning of the minute are prolonged to 0.5 s. DUT1 + dUT1: by Morse Code each hour be-
		10004	from 13 h 51 m to 24 h between minutes 5 and 10, 15 and 20, 25 and 30, 51 and 60 from 1 h 51 m to 13 h 10 m	tween minutes 31 and 32.
RIM	Tashkent USSR •41°19' -69°15'	5000	between minutes 15 and 20, 25 and 30, 35 and 40, 45 and 50 from 0 h to 1 h 30 m from 2 h 15 m to 3 h 50 m from 18 h 15 m to 24 h between minutes 15 and 20,	Second pulses*. The pulses at the beginning of the minute are prolonged to 0.5 s. DUT1 * dUT1: by Morse Code each hour between minutes 51 and 52.
tura			25 and 30, 35 and 40, 45 and 50 from 5 h 35 m to 9 h 30 m from 10 h 15 m to 13 h 30 m from 14 h 15 m to 17 h 30 m	

*The information about the value and the sign of the DUT1 + dUT1 difference is transmitted	after
each minute signal by the marking of the corresponding second signals by additional impuls	ies.
In addition, it is transmitted in Morse Code as indicated.	

Station	Location Latitude Longitude	Frequency (kHz)	Schedule (UT)	Form of the Time Signals
RKM	Irkutsk USSR + 52°46' -103°39'	10004	between minutes 5 and 10, 15 and 20, 25 and 30, 51 and 60 from 0 h to 1 h 10 m, from 13 h 51 m to 24 h	Second pulses*. The pulses at the beginning of the minute are prolonged to 0.5 s. DUT1 + dUT1: by Morse Code each hour between minutes 31 and 32.
		15004	between minutes 5 and 10, 15 and 20, 25 and 30; 51 and 60	tween minutes of and oz.
			from 1 h 51 m to 13 h 10 m	
RTA	Novossibirsk USSR +55°04' -82°58'	4996 9996	between minutes 5 and 10, 15 and 20, 25 and 29, 35 and 39 from 0 h to 1 h 29 m from 18 h 5 m to 24 h between minutes 5 and 10, 15 and 20, 25 and 29, 35 and 39 from 3 h 5 m to 4 h 39 m	Second pulses*. The pulses at the beginning of the minute are prolonged. DUT1 + dUT1: by Mors Code each hour between minutes 45 and 46.
	74.25°V	14996	from 14 h 5 m to 17 h 29 m between minutes 5 and 10, 15 and 20, 25 and 29; 35 and 39 from 5 h 35 m to 9 h 29 m f4om 10 h 5 m to 13 h 29 m	
RWM	Moscow USSR +55°19' -38°41'	10000	between minutes 30 and 35, 41 and 45, 50 and 60 from 1 h 30 m to 3 h from 17 h 50 m to 24 h	Second pulses*. The pulses at the beginning of the minute are prolonged to 0.5 s. DUT1 * dUT by Morse Code each hour betwee minutes 11 and 12.
6 A .	2 4 4 5 4 5 4 5 5 5 5 5 5 5 5 5 5 5 5 5	15000	between minutes 30 and 35, 41 and 45, 50 and 60 from 3 h 50 m to 17 h	minutes 11 and 12.
RTZ	Irkutsk USSR • 52°18' -104°18'	50	between minutes 0 and 5 from 0 h to 22 h 5 m	Al type second pulses*. The pulses at the beginning of the m ute are prolonged. DUT1 + dUT by Morse Code each hour between minutes 6 and 7.
				anter de la companya
4.50	34.45			
VNG	Lyndhurst Australis - 38° 3' -145°16'	4500 7500 12000	9 h 45 m to 21 h 30 m continuous except 22 h 30 m to 22 h 45 m 21 h 45 m to 9 h 30 m	Seconds markers of 50 cycles of kHz modulation; 5 cycles only fo Seconds markers 55 to 58; Secon marker 59 is omitted; 500 cycles for Minute markers. During the 5th, 10th, 15th, etcminutes, 5 cycles for Seconds markers 50 to 58. Identification by voice announcement during 15th, 30th 45 and 60th minutes. DUT1: CCIR code by 45 cycles of 900 Hz modulation immediately following the normal Seconds markers.
wwv	Fort-Collins USA + 40°41' +105° 2'	2500 5000 10000 15000 20000 25000	continuous	Pulses of 5 cycles of 1 kHz modu- lation. 59th and 29th second pul- omitted. Hour is identified by 0.8 second long, 1500 Hz tone. Beginning of each minute identi- fied by 0.8 second long, 1000 Hz tone. DUT1: CCIR code by doub- pulse. Additional information or corrections.
WWVB	Fort-Collins USA + 40°40' +105° 3'	60	continuous	Second pulses given by reduction of the amplitude of the carrier. Coded announcement of the date and time and of the correction to obtain UT1. No CCIR code.
wwvh	Kauai USA • 21°59' •159°46'	2500 5000 10000 15000 20000	continuous	Pulses of 6 cycles of 1200 Hz modulation. 59th and 29th seconds pulse omitted. Hour identified by 0.8 second long 1500 Hz tone. Beginning of each minute identified by 0.8 second long, 1200 Hz tone. DUT1: CCIR code by double pulse. Additional information or
YVTO	Caracas Venezuela +10°30' +66°56'	6100	12 h to 20 h 0 h 30 m to 1 h 30 m	UT1 corrections. Second pulses of 1 kHz modulation with 0.1 s duration. The minute is identified by a 800 Hz tone and a 0.5 s duration Between seconds 52 and 57 of each minute, voice announcement of hour, minute, and second
zuo	Olifantsfontein South Africa -25°58'	2500 5000	18 h to 4 h continuous	Pulses of 5 cycles of 1 kHz modu- lation. Second 0 is prolonged.

OTHER TIME SIGNALS: BPV, XSG, Shanghai, China, P.R., Latitude: +31° 12', Longitude: -121° 26'. Characteristics and schedule not known.

Military Operations Areas

It is a quiet afternoon as you sit in front of your radio. Suddenly, the thunderous roar of an overhead military jet fighter rocks you back into reality. You have just been buzzed by a routine practice flight originating from a nearby military air base.

As hazardous as you might suspect such flights are, they are carefully programmed by the mission commander and filed with civilian aeronautical authorities. The zone of flight is called a military operations area (MOA).

Here at MT headquarters, we are in the Snowbird MOA, assaulted on a routine basis by jet fighters dispatched from Shaw Air Force Base (SC) and Dobbins Air Force Base (GA). Presented below is a complete listing of MOAs nationwide. You will find yours there.

MOA NAME	LOCATION
ABEL	MCAS Yuma, AZ
ADA EAST/WEST	McConnell AFB, KS
ANCHOR BAY	NAS Alameda, CA
ANNE	Barksdale AFB, LA
AUSTIN 1, 2	NAS Fallon, NV
AVON-North-South-East	MacDill AFB, FL
BAGDAD 1	Luke AFB, AZ
BAKER	George AFB, CA
BASINGER	MacDill AFB, FL
BEAK A,B & C	Holloman AFB, NM
BEAUFORT, 1, 2 & 3	MCAS Beaufort, SC
BEAVER	Duluth Intl Arpt, MN
BENNING	Fort Benning, GA
BIG BEAR	Griffiss AFB, NY
BIRMINGHAM 1, 2	Birmingham Muni, AL
BISON	McConnell AFB, KS
BOONE	Des Moines, IA
BRADY	Bergstrom AFB, TX
BRISTOL	Twentynine Palms, Ca
BRONSON	Grand Forks AFB, ND
BROWNWOOD 1 & 2	NAS Dallas, TX
BRUNEAU 1 & 2	Mt Home AFB, ID
BRUSH CREEK	Rickenbacker ANGB, OH
BULLDOG A, B & D	Show AFB, SC
CALVERTON 1 & 2	Bethpage, NY
CAMDEN RIDGE	Dannelly Field, AL
CAMPBELL 1 & 2	Fort Campbell, KY
CHASE 1, 2 & 3	NAS Chase Field, TX
CHINA	McClellan AFB, CA
CHINOOK A & B	Whidbey Island, WA
CHIPPEWA	Battle Creek, MI
COCOA	Patrick AFB, FL
COLLINS	Phelps Collins ANGB, MI
COLUMBUS 1, 2, 3 & 4	Columbus AFB, MS

MOA NAME	LOCATION	M
MOA NAME	LOCATION	-
COMPLEX	Edwards AFB, CA	ر
		١
CONDOR 1, 2	Pease AFB, NH	K
CROWNPOINT	Kirtland AFB, NM	K
CRYSTAL	Kelly AFB, TX	K
DEEPWOODS	Bangor, ME	K
DELMAR	Patuxent River NAS, MD	L
DEMO 1, 2 & 3	Quantico MCAF, VA	, L
		L
DESERT	Nellis AFB, NV	ι
DESOTO	NAS New Orleans, LA	Ł
DEVILS LAKE	McChord AFB, WA	L
DRUM 1 & 2	Hancock Field, NY	ι
DUKE	University Park, PA	ι
EAGLE 1, 2 & 3	Eielson AFB, AK	t
EDGEMONT	Ellsworth AFB, SD	٨
EGLIN A, B, C, D, E & F	Eglin AFB, FL	٨
EUREKA	McConnell AFB, KS	٨
EVERS	Langley AFB, VA	
FAGUS	Blytheville AFB, AR	
FALCON 1 & 3	Griffiss AFB, NY	
FALLS 1	Volk Field, WI	٨
FARMVILLE	Langley AFB, VA	٨
FLAGLER	Buckley ANGB, CO	١
FOOTHILL 1 & 2	NAS Lemoore, CA	-
FORT BRAGG NORTH A & B	Fort Bragg, NC	
FORT BRAGG SOUTH A & B	Fort Bragg, NC	(
FORT STEWART A, B1, B2 & C	Fort Stewart, GA	
FREMONT	Buckley ANGB, CO	(
FUZZY	Tucson, AZ	
GABBS NORTH, SOUTH	NAS Fallon, NV	c
GALENA	Elmendorf AFB, AK	c
GAMECOCK A, B, C & D	Myrtle Beach AFB, SC	P
GAMECOCK I	Shaw AFB, SC	P
GAMECOCK J	Shaw AFB, SC	Р
GANDY	Hill AFB, UT	P
GATOR LOW	NAS Cecil Field, FL	P
GLADDEN 1	Luke AFB, AZ	٧
GOOSE	Kingsley Fld, OR	P
GUNTERSVILLE	Dobbins AFB, GA	P
HATTERAS F	MCAS Cherry Point, NC	. P
HAYS	Mc Chord AFB, WA	P
HIAWATHA	K.I. Sawyer, MI	P
HILLTOP	Fort Wayne, IN	c
	Fort Smith, AR	c
HOG 1,2 & 3		1,
HOLLIS	Sheppard AFB, TX	R
HOOD	Fort Hood, TX	R
HOTROCK 1,2 & 3	England AFB, LA	R
HOWARD EAST	Springfield, IL	R
HOWARD WEST	Springfield, IL	R
HUMMER 1, 2, 3, 4, 5, 6 & 7	CONTRACTOR AND AND ADDRESS OF THE PARTY OF T	R
HUNTER	NAS Lemoore, CA	R
HURON	Phelps Collins ANGB, MI	R
INDIA 1,2,3	England AFB, LA	R
IENA 1 2	England AER IA	

MOA NAME	LOCATION	
JONES	Barksdale AFB, LA	
JUNIPER A & B	McChord AFB, WA	
KANE "	NAS Miramar, CA	
KINGSVILLE 1 & 2	NAS Kingsville, TX	
KIOWA	Fort Indiantown Gap, PA	
KIT CARSON A & B	Buckley ANGB, CO	
LADY	Barksdle AFB, LA	
LAKE ANDES	Sioux City, IA	1
LAKE PLACID	MacDill AFB, FL	
LAUGHLIN 1, 2 & 3	Laughlin AFB, TX	
LAVETA	Buckley ANGB, CO	
LINCOLN	Lincoln, NE	
LIVE OAK	NAS Cecil Field, FL	
LORING	McChord AFB, WA	
LUCIN A, B & C	Hill AFB, UT	
MARIAN	Patrick AFB, FL	
MAXWELL 1, 2, 3, 4, 5, 6	Mather AFB, CA	
MERAMAC	Lambert Field, MO	
MERIDIAN 1 EAST & WEST	NAS Meridian, MS	
MINNOW	Milwaukee, WI	
MISTY 1, 2 & 3	Griffiss AFB, NY	
MOODY 1, 2A, 2B & 3	Moody AFB, GA	
MORENCI	Tucson, AZ	-
NAKNEK 1 & 2	Elmendorf AFB, AK	
NEW RAYMER A & B	Greely, CO (TAC)	
OKANOGAN	Whidbey Island, WA	1
OLYMPIC A & B	Whidbey Island, WA	
O'NEILL ,	Lincoln, NE	
ONTONAGON	Griffiss AFB, NY	
OWYHEE	Mt Home AFB, ID	
PALATKA 1, 2 & 3	NAS Jacksonville, FL	
PAMLICO A & B	NAS Oceana, VA	
PARADISE	Mt Home AFB, ID	
PECK	Selfridge ANGB, MI	
PECOS EAST HIGH & LOW, WEST HIGH & LOW, SOUTH	Cannon AFB, NM	
PENSACOLA NORTH, SOUTH	NAS Pensacola, FL	
PICKETT 1, 2, 3	Byrd IAP, VA	
PINE HILL EAST & WEST	NAS Meridian, MS	
PINON CANYON	Fort Carson, CO	
POWERS	Minot AFB, ND	
QUAIL	MCAS Yuma, AZ	
QUICK THRUST E, F, G, H,	Shaw AFB, SC	
RAINIER 1, 2 & 3	Ft Lewis, WA	
RALPH	Phelps Collins ANGE, AI	
RANCH	NAS Fallon, NV	
RANDOLPH 1A,1B,1C,2A,2B	Randolph AFB, TX	
RAPPA 1 & 2	NAS Patuxent River, MD	
RED HILLS	Terre Haute, IN	
a file a fa	Reese AFB, TX	
REESE 1, 2, 3, 4 & 5	MARKET TANKS TON	
RENO	Reno Int'i, NV	
- resolver of hotel series	Reno Int'i, NV Tucson, AZ	

	MOA NAME	LOCATION
	ROBERTS	NAS Lemoore, CA
	ROBY	Dyess AFB, TX
	ROOSEVELT	Whidbey Island, WA
	ROSE HILL	Jacksonville, FL
	RUBY 1	Tucson, AZ
	RUCKER A,B & C	Ft Rucker, AL
	SADDLE A & B	Boise, ID
	SALEM	Lambert Field, MO
	SAYLOR	Mt Home AFB, ID
	SAYLOR 4	Mt Home AFB, ID
١	SELLS Low, 1	Luke AFB, AZ
1	SEVIER A & B	Hill AFB, UT
I	SEYMOUR JOHNSON ECHO	Seymour-Johnson AFB, N
1	SHEEP CREEK 1 & 2	Mt Home AFB, ID
	SHEPPARD 1, 2, 3, 4 & 5	Sheppard AFB, TX
	SHILO	Patrick AFB, FL
	SHIRLEY 1	NAS Memphis, TN
1	SMOKY	McConnell AFB, KS
1	SNAKE 1	Mt Home AFB, ID
	SNAKE 2	
		Mt Home AFB, ID
l	SNOOPY	Duluth Intl Arpt, MN
1	SNOWBIRD 1	Dobbins AFB, GA
	SNOWBIRD 2	Show AFB, SC
ı	STONY A & B	Elmendorf AFB, AK
l	STUMPY POINT	NAS Oceana, VA
1	SUNDANCE	Twentynine Palms, CA
	SUNNY	Luke AFB, AZ
l	SUSITNA	Elmendorf AFB, AK
	SYRACUSE 1, 2, 3 & 4	Hancock Field, NY
1	TALON	Holloman AFB, NM
1	TEXON 1	Bergstrom AFB, TX
I	TIGER NORTH, SOUTH	McChord AFB, WA
١	TILFORD	Ellsworth AFB, SD
1	TOMBSTONE A, B & C	Davis-Monthan AFB, AZ
	TRACY 1 & 2	McConnell AFB, KS
١	TRUMAN A, B &C	Richards-Gebaur AFB, M
	TURTLE	MCAS Yuma, AZ
ı	TWELVE MILE	Ft. Wayne, IN
١	TYNDALL A	Tyndall AFB. FL
1	TYNDALL B, C, D, E, F & G	Tyndall AFB, FL
	VALENTINE	Holloman AFB, NM
1	VANCE IA & IB	Vance AFB, OK
	VOLK, EAST A & B, WEST	Volk Field, WI
	WAITTS A, B & C	Fairchild AFB, WA
1	WASHITA	Sheppard AFB, TX
l	WHITMORE 1, 2 & 3	Beale AFB, CA
-	WILLIAMS 1, 2, 3 & 4	Willimas AFB, AZ
1	WILLIAMS 3A	Davis-Monthan AFB, AZ
1	WILLISTON	McChord AFB, WA
1	YANKEE ONE	Bradley IAP, CT
		Bradley Intl, CT
1	YANKEE TWO	
	YUKON 1 & 2	Eielson AFB, AK
1	(*)	

Editor-in-Chief, Passport to World Band Radio

Heathkit/Zenith SW-7800 Receiver

In the September issue of Monitoring Times, reader Izak Luchinsky indicated that he would be interested in finding out more about Heath products. As good fortune would have it, at Passport to World Band Radio -- the new name for Radio Database International -- we have had the opportunity to test a number of Heath's SW-7800 general coverage

Heath Corporation Grows and Evolves Over The Years

It was shortly after World War II that the Heath Company, a small firm from rural Michigan, began designing and selling inexpensive electronics kits. While other American firms were all but driven out of the shortwave market by more efficient Japanese and other overseas firms, the little U.S. operation on the snowy side of Lake Michigan grew and prospered. Kit making had caught on, and the rest

As the Heath Company grew, it passed through various corporate hands. It was acquired briefly by Daystrom, then for many years it was owned by the prestigious oil service/electronics firm of Schlumberger, Ltd. In recent years, it has been part of the Zenith Corporation, itself well known to veteran shortwave listeners for its hefty tube-type "Transoceanic" shortwave portables of yore.

New Receiver Available Only in Kit Form

In 1984, Heath broadened its line to include the SW-7800, a general overage -- 150 kHz to 30 MHz --tabletop receiver with digital frequency readout. The design is fairly modern, but it breaks no technological ground. And it was available only in kit form -- a plus for creative hobbyists who enjoy wiling away the hours with soldering guns. In this regard, Heath's traditionally well-written instructions and supportive technical staff are a real plus: After all, assembling a '7800 isn't a snap. It takes a good 50 hours or so!

Straightforward Controls

The '7800's digital readout -- to the nearest kilohertz -- is displayed by five red LEDs. Tuning is controlled by two knobs: one for megahertz, the other, kilohertz. A mode switch allows you to choose among AM, lower and upper sideband, plus CW (for code reception). The front panel also includes an analog signal-strength meter, a slow/fast automatic gain control switch and variable attenuator. There also is a single-step attenuator switch behind the set to supplement the front panel control.

While certainly not a portable -- it has no provision for internal

batteries -- the '7800 can be operated from an external 12-16V dc power supply, as well as normal ac house current. And, even though it's a tabletop, it comes with a builtin telescoping antenna. Most tabletops don't.

Two Selectivity Positions Really More Like One

Two selectivity positions, con-trolled by the mode switch, are marked on the set's front panel. Normally this would indicate that the receiver has two bandwidth filters in the intermediate frequency (IF) stage. Alas, this is not the case with the '7800. It has only one IF bandwidth filter -- albeit a decent 5.5 kHz "wide" choice. The "narrow" position, however, is nothing more than an audio filter which gets involved in interference cleanup only in the very late stages of the reception process. As audio filters go, the device works well enough. But it just can't clean up interference quite as well as would a good second IF filter.

Original Version Poor

In late 1984 we tested our first sample of the '7800. Its performance was grossly deficient. To begin with, the receiver overloaded badly. In addition, the produced an assortment of strange whistles and spurious noises. As if this weren't enough, the digital frequency counter ran amok from about 20 MHz on up. Once you tuned above that point, you literally had no idea of what frequency was being received!

Drifting was also a serious problem. As the set warmed up, the frequency changed as much as 10 kHz in two hours, and 4 kHz more afterwards. That's three channels in all -- something like tuning a TV to channel 2 and a few hours later finding it's drifted to channel 5! This sort of performance was just not acceptable.

The '7800's performance was so bad, in fact, that -- incredulous -we checked with colleagues at an amateur radio testing facility who were evaluating another sample. Their tests showed the same problems as ours.

Some Improvements

Once Heath became aware of these problems -- God only knows how

they could have overlooked them in the first place -- they decided that some design modifications would be in order. We have tested the resulting revised version, which came on the market in 1986, and have found that, indeed, some

To begin with, the revised '7800 has slightly improved dynamic range and blocking. This, at the cost of reduced sensitivity, has made overloading somewhat less of a problem. More importantly, the drifting in the original version has been tamed to a more respectable, albeit mediocre, 3 kHz during the first hour of use. The frequency counter now performs satisfactorily up to about 29 MHz -- nearly the top of the set's range -- before failing to count properly.

...But Still No Cigar

Whistles and other spurious signals, unfortunately, still plague the set. The varying pitch of the whistles normally would suggest poor image rejection, but lab tests show the SW-7800's image to excellent. rejection be Although our lab could not isolate the cause, the most likely culprit appears to be the noisy frequency synthesizer -- alone or in concert with the set's IF. Single-sideband reception continues to be difficult and exalted-carrier selectablesideband (ECSS) all but impossible -- thanks to both the frequency instability and the lack of a narrow IF bandwidth filter. Additionally, the product detector distorts -- a relatively minor point of concern only when tuning in the SSB/ECSS modes.

Unusually Low Price

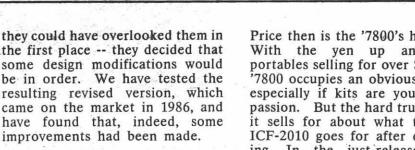
The Heath Company (Benton Harbor MI 49022 USA) has priced the SW-7800 at \$349.95 in the US, although a reduced price of \$299.95 has been reported recently. This makes it far and away the cheapest tabletop world band receiver available new on the market today. Anything better costs nearly twice Price then is the '7800's high card With the yen up and some portables selling for over \$300, the 7800 occupies an obvious niche especially if kits are your specia passion. But the hard truth is tha it sells for about what the Son ICF-2010 goes for after discount ing. In the just-released 1981 Passport to World Band Radio, the '2010 is rated as being very good while the '7800 is rated as bein only fair.

The fact is that Heath has neve really understood shortwave listen ing. Even going back a quarte century, its shortwave receiver have been dreary performers. On model -- designed some years bac for the ham market that Heat knows so well -- was the sol exception.

Today, the shortwave listenin market is divided between lower cost portables and higher-cost tabletop models. Trying to swii upstream with a low-cost, low performance tabletop simply hasn succeeded. Tabletops are per ceived as high-performance item and the '7800 is anything but.

You can hear Larry Magne equipment reviews, along wil reports from Passport to World Ban Radio's Don Jensen and Tony Jone the first Saturday night each mon over Radio Canada International "SWL Digest" at 8:10 PM Easter Time on 5960 and 9755 kH Larry's "What's New in Equipmen is also featured over "SWL Diges various other Saturdays througho

In the US, RDI White Papers a carried by Electronic Equipme Bank, Imprime and Univers Shortwave. A free catalogue of that latest editions of all available Ri White Papers, including tho covering the best in communicatio receivers and antennas, may obtained by sending a self-address stamped envelope to Publicatio Information, Radio Database Inte national, Box 300, Penn's Park I 18943 USA.



Spend 50 hours putting together Heath's general

coverage shortwave receiver kit and you'll probably

have a good time. But you won't have a good radio.

"Terminator"

A Winner for the Serious, Computer-Equipped DXer

by Arch Wicks W6SWZ

You may have seen one in an airport lobby, or in a travel agency. A framed map of the world, backlighted, and with a dark band slowly moving across the face of the earth. The dark band represents darkness, and its edge is the demarcation between it and daylight.

On many occasions I have marvelled at the ingenuity of one of these presentations, inasmuch as they operate in real-time--obviously linked to an electrical clock. Once, I went as far as tracking down a manufacturer, and was shocked to find that one would cost me over \$300.

Real Savings!

Now, however, I have overcome that problem and for one-tenth of that amount, I have my own. It operates on my PC-compatible computer. And best of all, it offers more features than an of the standard electro-mechanical displays I used to admire.

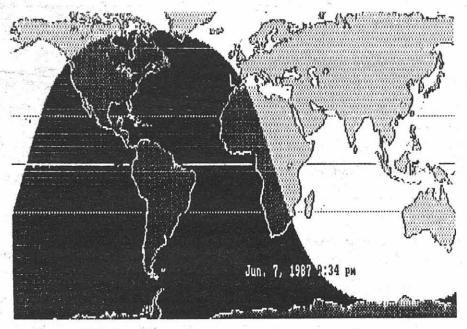
The solution was an unassuming program produced by Trillium, called "Terminator" and is named for the "termination" between daylight and darkness. The correct astronimical name for this zone is "terminator," but it is also sometimes called the "twilight zone" or "grayline."

Sounds interesting. But what does something like this have to do with communications monitoring? And the answer is "lots" -- especially when all of the program features are considered. Let's look at some background material, and then review these features.

DXer's Delight

As you probably know, darkness and daylight has a definite effect on the height of the ionosphere that surrounds Earth. At night, the D and E layers of the ionosphere disappear, and the F1 and F2 layers combine to form a single layer. In turn, the height of the ionosphere affects the propagation of radio frequency energy over a large portion of the wavelength spectrum, starting approximately with frequencies 30 MHz and lower. This is, of course, why distant stations may be heard in the broadcast band (540-1650 kHz) at night -- ones which can not even be faintly heard during the day.

At the same time, other higher frequency signals (e.g. 20 MHz), will disappear entirely during darkness. During daylight, these same



frequencies will allow reception of signals from halfway around the earth. Because of the great many effects that the sun has on the ionosphere and its various layers, anyone into DXing would be well advised to study the subject further, as there are other factors -- such as sunspots for instance -- involved in night/day propagation.

Grayline DXing

There are some particularly interesting phenomena that develop at sunrise and sunset. One of these is "grayline propagation." As this area has neither full daylight nor full darkness (which accounts for its other name: "twilight zone"), and is changing rapidly with the rotation of the earth, the effect on the ionosphere is strictly defined predictable. It may well and provide some exceptionally good DX not only along the longitudinal axis, but particularly in the situation where the listening station is in the sunset grayline and the other location is in the sunrise zone (or vice versa).

A excellent example of this presented itself to me on the date and a little before the time shown on the Figure. I consulted the Terminator and noted the possibility of DX from Europe on 14 MHz. A brief listen soon confirmed this, with several stations in England and the continent coming in at from S6 to S8. I soon contacted another amateur statio in Poland, and had a brief but pleasant contact with good signals both ways from my location in California.

Another glance at the grayline showed that there could be some results expected from the South Pacific, and sure enough I was soon in contact with a station in New Zealand for a nice chat. Grayline DXing sure looks good to me!

Using Terminator

The program displays a map (see figure), which shows the terminator quite clearly. By entering the date and time when you start up your computer, *Terminator* automatically compensates for Daylight Savings (and European Summer) Time, if they are in effect, as it loads.

All operations are extremely simple. Merely typing TERMINAT loads and starts the program, which displays a world map. Obviously, this will tie up the computer for any other use if you continuously display the map. However, an easy option allows you to dismiss the program but retain it in memory for instant recall at any time.

As a ham, that is how I keep Terminator on call; I use the computer for logging, but leave Terminator in memory for immediate reference to the daylight/darkness display, and for several of the other useful features.

Other Functions

One function key will call up short menu of other features. One of these choices is "Display Selected Cities." With this, the monitor will show the current time in up to 24 cities worldwide -- very handy when monitoring DX stations. The city names and locations are clearly marked on the map, together with the terminator. In addition, your local date and time are also function key controlled, and may be toggled off and on as desired.

Another good feature that can be switched in shows all of the world's time zones. Therefore, if you know the general location of some place that you are listening to but which is not entered as one of the 24 locations, you can easily deter-

mine the time there. If you want to permanently change or add other locations, such as "Moose Jaw" or some place having a fractional time difference, a custom change or addition can be made.

If you would like to see what is ahead as far as when or where darkness (or daylight) will occur, you may toggle in a "high-speed" mode which advances the clock at a rate determined by pressing the "+" or "-" keys on your computer. This speeds up the intervals between screen refreshing, along with the intervals representing two minutes to up to one week for every second of real time.

For instance, if I wanted to know if it would be completely dark in India six hours from now, I could speed up the display until it reached the time desired.

Second Map Display

One other map display is available. This shows the lines of latitude and longitude. Any of the maps available can always show city times simultaneously; however, with too much information displayed at one time the display tends to be cluttered and confusing.

An interesting aspect of the whole display is that not only is the terminator changing constantly as the sun moves across the face of the earth, but it also changes position with the seasons. It may be observed that total darkness (or constant daylight) envelopes the Arctic (or Antarctic) regions 24 hours a day depending upon the ecliptic and the solstices of the sun.

The width of the terminator (or twilight) is not shown, as a few hundred miles is too small an area to represent. As the actual position of the terminator is a sunrise and sunset by local time, it should be quite adequate for any spotting purposes in pursuing grayline DX.

Astronomy

There are several features in Terminator that do not have a monitoring or communications reference--at least not directly. These may be of interest to anyone who has astronomy as a hobby, and will only be briefly mentioned here.

A marker on the screen, which indicates the position on the earth's surface when the sun is directly overhead at noon Solar Times, may be toggled on and off. The declination of the sun will be quite evident as it moves between the Summer and Winter Solstices. (The Equator, and the Tropics of Capricorn and Cancer are always visible on the map.)

Also, for astronomy buffs, the analepsis of the sun (if you don't know what that is, then you aren't one), may be observed in rapid motion by using Terminator in week-at-a-time mode.

Evaluation

There are no major problems in the operation of Terminator. The instructions are complete, informative, and well-written. A minor deficiency is a reduction in resolution, or quality of the display, when using either the Time Zone map or the Latitude and Longitude map; not seriously so, but noticeable.

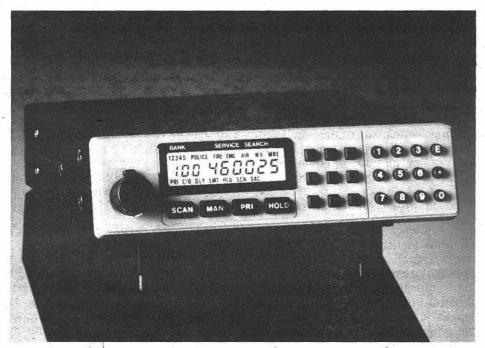
Although the times shown are all in the civilian (a.m.-p.m.) method, I would like to have seen an option to display the 24-hour Universal Coordinated Time (UTC) system.

For esthetic reasons I would like to see less distortion of the map display. This distortion may not occur with all computers, however, and may be due to the pixel configuration of my "compatible" unit, which may also have a different aspect ratio than that for which the program was designed.

A color display would also be a nice touch--particularly if the water area could be shown in blue.

Nontheless, the program is a winner, and should be useful for the purposes stated. The price is right, and is well worth the \$30.00 total cost (includes shipping, taxes, etc.)

Available from TRILLIUM, 3770 Highland Ave, Suite 208 Dept.MT, Manhattan Beach, CA 90266



when pressed and legends are bold and easy to read. The LCD display is backlighted yellow-orange, making night viewing a snap.

The usual array of Bearcat functions is present: search, individual channel lockout, channel one priority* search hold, and individual channel delay. Rear apron jacks are provided for external speaker, tape recorder audio, 12 volt power, and external antenna (Motorola plug).

Accessories provided with the unit include an AC power adaptor, plugin whip antenna, mobile mounting kit, and full instructions.

Installing the options: A signalboosting preamplifier, a CTCSS (subaudible) tone-squelch decoder and a switch panel are available for

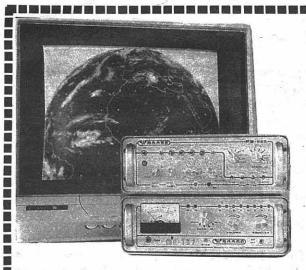
*A preliminary specification erroneously stated that the BC600XLT had five priority channels; this error was carried into the October MT Grove Enterprises advertisement. We regret the error.

Bearcat BC600XLT Scanner

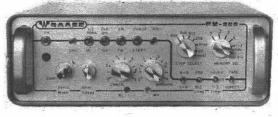
A high performance, ultra compact scanner is always good news. More, this little unit doesn't compromise features. Boasting a frequency coverage of 29-54 MHz low band FM, 118-136 MHz civilian aircraft AM, 136-174 MHz high band FM, and 406-512 MHz UHF FM, the new Bearcat has pre-programmed service

search for police, Fire/EMT, marine, aircraft, and weather just like its alltime favorite, but much larger, predecessor, the BC300.

A whopping 100 channel memory may be scanned sequentially or divided into five 20-channel banks; rubberized keys have good "feel"



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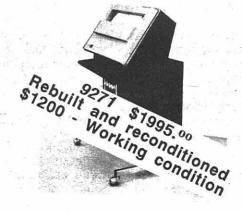
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BC-600XLT cont'd from p.47

the BC600XLT. Installation takes about 15 minutes and requires removing the radio from its cabinet with a Phillips screwdriver; no soldering is necessary.

With the tone-squelch decoder installed and switched on by the optional switch, any of the 38 CTCSS tones may be programmed by the scanner keypad into any combination of channels. When engaged, only those channels will be scanned; when switched off, all channels are scanned.

There is a distinct improvement in weak signal strength when the optional preamplifier is switched on. We would suggest its use in suburban or rural areas, or anywhere average signals levels are low such as when the plug-in whip is used or in openroad mobile operation.

When operating on a desk, a tilt-down bracket is engaged, allowing the 600 to face upward, optimizing the audio as well as the viewing angle of the display and controls.

So how does this new entry perform? Does it live up to its expectations? Let's find out.

A simple test

We connected the 600 to an external antenna and compared it with a BC210XLT. Scan rate was fast and sensitivity was excellent, obviously

meeting the published specifications. Audio was pleasing from the bottom-mounted speaker; the 2.5 watt audio amplifier is loud enough for any mobile application. Styling is attractive, functions are easy to access and straightforward.

In a field test using the BC600XLT in a metropolitan environment, image rejection and intermod immunity were both above average, an improvement over previous Bearcat models.

Are there any bad points?

There is no operating manual, merely a large, folded sheet which must be cut up to return the warranty registration; the volume control has no indexing mark to show its setting; an audible "tick" can be heard during the scanning sequence in a quiet room; two AA-size memory backup batteries are required (even without them the radio will retain memory during brief power outages).

Accepting these petty criticisms, the scanner is an exceptional value. Clearly, an exciting new generation of scanners is emerging from Uniden; the BC600XLT is the pacesetter.

(BC600XLT, \$224.95 plus \$5 shipping from Grove Enterprises; preamplifier, \$25; CTCSS decoder, \$60; switch (required for either option), \$8.95. Installation fee at time of order, \$10.

Realistic PRO-38 Scanner

If you sense something familiar-looking about the new Realistic PRO-38 hand-held scanner, it isn't just your imagination. Made for Tandy by Uniden, the new programmable is an upgrade of the Bearcat BC50XL scanner.

Substantial improvements, however, have gone into the Tandy version. Even the cabinet is attractively metallic-accented, replacing the bland brown box of its Bearcat predecessor. More important, however, is what has happened inside the box

The user may choose between conventional AA replaceable cells or nicads for power; a small switch in the battery compartment selects the option. With a full charge, the nicads will operate the radio for a full day without the premature "beep-beep" low battery signal which was so annoying on the BC50XL.

A new microprocessor controls the internal circuitry on the PRO-38, but the remainder of the radio's functions are the same as the former Bearcat: ten memory channels with individual channel lockout, three second scan delay, keypad lock switch, review button to check frequency entry, LCD channel display, earphone jack, and BNC-fitted flex antenna.

Audio is strong and clear, sensitivity is certainly equal to other scanners,

and an internal voltage regulator allows charging or operation from an external 12 volt DC source. Scan rate is typically 12 channels per second. Frequency range is 29-54, 136-174 and 406-512 MHz, FM mode.

After a day's listening, we would rate the new PRO-38 an excellent value for an introductory level scanner.

(PRO-38, \$124.95 plus \$3 shipping from Grove Enterprises; \$139.95 plus local sales tax at Radio Shack outlets)

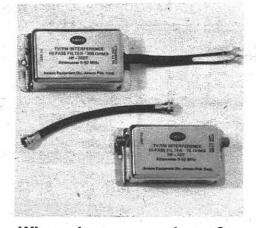
Ameco Interference Filters

The name AMECO has been associated with amateur radio equipment and accessories for decades. At one time the company had low-cost receivers and transmitters as well as license study guides (the guides are still very much alive).

AMECO was sold to Aerotron in the early 1970s, but reacquired a few years later. They are once again making a thrust into the amateur radio market with their accessories.

Most recently, AMECO has released a high pass filter available in two configurations: The HP-75T (equipped with type F connectors for coaxial lines) and the HP-300T (for screw-terminal twin-lead attachment). With R.L. Drake no longer making TVI filters, the AMECO device stands alone on the market.

The filter is designed to attach between the TV set and the incoming signal line and is intended to pass signals above 52 MHz (TV channel 2 begins at 54 MHz). The sharp rolloff of the filter exhibits 70 dB attenuation at 50 MHz, only two megahertz below its cutoff frequency.



When do you need one?

Unless your TV is connected to a cable distribution system, you probably suffer interference of one kind or another at some time on some channels. If the interference is due to signal overload coming in the antenna line at frequencies below 50 MHz, the AMECO filter should offer relief. Thus, it is also applicable to FM broadcast receivers and VCRs as well.

Low frequency interference sources which may be reduced by the filter

include those from amateur SSB/CW transmitters, CB radios, low-band (30-50 Mhz) two-way radio equipment, and some appliances.

A peek inside

The enclosure is all metal, housing nine shielded sections composed of 25 elements, thus accounting for the impressive rolloff characteristic below 52 MHz. A short length of coax with male F connectors on each end comes with the version HP-75T to allow interconnection of the device with an existing line.

Since many of us use preamplifiers ("boosters") with our VHF/UHF receiving equipment, it is worth mentioning that any filter--including this one--should be placed between the antenna and the amplifying device. This reduces the possibility of strong signal overload affecting the preamp.

What won't it do?

If the interference is actually being generated on the frequencies to which you are tuned, no filter will help since a filter which would reduce the interference would also reduce the desired signal level. If the interference in coming in through the power line rather than the antenna, the filter won't help; fortunately, this is rarely the case.

There is no substitute for a good ground and appropriate shielding on transmitting equipment. If the transmitter is located near the TV set which is experiencing interference, the direct radiation will be unaffected by the installation of an antenna line filter. Remember, TV sets are enclosed by plastic or wood, not metal which could act as an effective shield.

When proper precautions are taken against direct RF radiation or signals being generated on frequencies above 50 MHz, and equipment operating below 50 MHz is causing interference, then it's time to employ an effective high pass filter like the AMECO.

(AMECO HP-75T or HP-300T filter, \$12.95 plus \$2 shipping from AMECO Publishing Corp., 220 E. Jericho Turnpike, Mineola, NY 11501) Electronic Equipment Bank—Order Toll Free 800-368-3270

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OPTIONS: FIF-232C for RS232 compatible computers; \$69.95. VU-9600 for tuning in TV stations with your 9600 and video monitor, \$25.00. 99 memories.

ICOM R-7000 E \$949.00

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Commercial Receiver VHF-UHF 25-2000 MHz

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- 25-2000 MHz coverage
- Precise frequency entry via keyboard
- · 96 programmable memories
- · Scan-memory-mode-select memory-frequency
- 5 tuning speeds: 1, 1.0, 5, 10, 12.5, 25 KHz
- Narrow/wide filter selection
- · Memory back-up · Noise blanker
- . "S" meter or center meter for FM
- . AM & FM wide, FM narrow, SSB, CW

EEB HP OPTIONS

- 1. Front end upgrade improves sensitivity.
- 2. Audio mod for better volume, less distortion.
- 3. Spike protection on AC line.
- 4. 24 hour bench test, Final alignment & overall checkout. Numbers 1 through 4 above for \$200.00
- 5. Power Supply mod: A completely new power supply reduces the heat buildup & lowers the noise floor for longer component life and increased sensitivity. Price is \$150.00.
- 6. Multiplex output mod for SCA and Subcarrier Analysis. Price: \$50.00

SCANNERS

RADIO SHACK! **PRO 31A**

Handheld 10 channels, \$189.95 + \$4.00 UPS

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- Table/Mobile 13.8 VDC
- · Dual Scan Speed · AM, FM
- · Metal case · DX Local switch
- \$199.95 + \$6.00 UPS

SX-400

- 26 520 MHz
- 20 Memories
- · Converters for up 1.4 GHz - call
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AR2002 SCANNER

- 25 MHz to 550 MHz & 800 MHz to 1300 MHz
- . FM (wide & narrow) and AM
- · LED "S" meter · Scanning
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- Professional class performance

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RTTY - CW - AMTOR SPECIAL SALE WHILE SUPPLIES LAST!

AEA CP-1 Computer Patch

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- Matches Most Any Antenna Improves Gain and Noise Figure
- 9V Battery PWR
- (not included)
- AC Adapter Optional (\$9.95) (Order - P9T)
- 200 kHz-30 MHz
- Preselector

• Indoor Active Antenna \$74.95 +\$4.00 UPS

ANTENNAS

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- · Balanced trapped Dipole
- Maximum performance, Minimum local noise
- · All SW Bands 60-11 meters
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- · Complete Everything you need.

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- Outdoor active antenna
- Performs as well as units costing \$180.00
- · WRTVH rates it high

ICOM AH7000 \$89.95 + \$4.00 UPS

Discone Antenna for ICR7000/others w/type 'N' antenna connector. 25-1300 MHz!

50' of Lo-Loss Coax Cable Included. **D-130 ANTENNA** \$79.95 + \$4.00 UPS

Same as above but with PL-259 connector. 50 ' of Coax Cable Included.

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ALL NEW FROM SONY! **WORLD BAND RADIO** THE NEW ICF-7700

- 15 Bands-12 SW, MW. LW & FM
- 15 Station memory presets
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- Built in clock & sleep timer • 4 1/2" × 7 1/2" × 1 1/4"
- Earphone, carrying case, SWL book included. AC-D4L Optional AC Adaptor \$21.95

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DON'T LET ITS SMALL SIZE FOOL YOU! A FULL FEATURED RADIO THAT WILL FIT IN YOUR POCKET. THE **ULTIMATE IN PORTABILITY!**

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SONY CALLS THIS RADIO THE 'PRO80' & HERE'S WHY:

- Covers 150 kHz to 216 MHz!! (with supplied converter)
- · AM, FM, (wide & narrow); SSB · 40 Station Memories! · Memory scan, Program scan, Limit scan, up/down manual scan and priority scan! . Automatic and manual
- \bullet Handheld radio 3 1/2 " \times 7 1/4 " \times 2 " and weighs 1 lb. 7 oz.
- Rechargeable battery Pak (opt) Comes with tele-scopic antenna, shoulder belt, carrying case, wave book, frequency converter and BNC adaptor.

PANASONIC RFB60 Compact multi-band radio

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- 6-way tuning system
- Clock/Timer with Sleep
- LCD Readout

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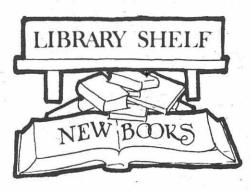
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Passport to World Band Radio (Radio Database International)

by Larry Magne and Tony Jones (400 pages, 7" x 10", perfect bound; \$14.95 plus \$2 shipping from Grove Enterprises; available also from other MT advertisers)

Highly polished and eminently authoritative, this 1988 edition lives up to its title. Regardless of your worldwide broadcast listening preference, *Passport's* colorful and definitive text comprise an indispensable goldmine of up-to-date information.

Introductory chapters by a variety of well-known shortwave experts provide valuable listening tips from around the globe. A comprehensive, illustrated buyer's guide tells you in no uncertain terms which radios represent the best values and which to stay away from.

Finally--and foremost--the frequency section, a logically-arranged directory of world broadcasters heard between 2 and 22 MHz. Listed by frequency and cross-referenced by time, country, language, and transmitter power, accurate details at your fingertips assure your success when you switch on your receiver.

Queensland Frequency Register - 1986 edition

by Richard Barrett (244 pages, 8-1/4" x 5-3/4", looseleaf binder; price and availability from ESG, PO Box 280, Hahndorf 5245, South Australia)

While Australian recipients of *Monitoring Times* are a distinct minority, scanner enthusiasts in the "land down under" will appreciate the work that went into assembling this professionally-printed scanner directory.

Concentrating on the 35-520 MHz portion of the spectrum, Barnett's listings include transmitter (and receiver where different) frequency, call sign, user, and location. Major licensees are industrial, government, police and fire, marine, airlines and airports, public utilities, conservation, and businesses.

North American listeners would be interested in the similar bandplan used in Australia as compared to the U.S. and Canada. Australian monitors and retailers would do well to contact ESG for details on obtaining this well-assembled VHF frequency directory.

Station Address List

by Ravindranath G. Sewdien (44 pages, 6" x 8", staple bound; for ordering information write to the author in care of the Suriname DX Club International, Bechaniestraat 58, Paramaribo, Suriname)





This concise directory of addresses for international broadcast listeners is cleverly arranged by frequency. If you are listening, say, to the Zambia Broadcasting Services on 6165 kHz, merely look up that frequency, find R Zambia, and the mailing address follows.

Containing some 2000 listings, the booklet is a handy desk-side reference for the QSL hound.

National Contest Journal

published by the American Radio Relay League (31 pages, 5-1/4" x 8-1/2", staple bound; bimonthly magazine. \$10 per year from NCJ Circulation, ARRL 225 Main Street, Newington, CT 06111)

If you are a ham interested in contesting as a competitive sport, the new NCJ will keep you up to date. Featuring articles of aid to contesters (antennas, switching, techniques and tips, etc.), as well as contest details. NCJ is definitely for the indefatigable contester!

LA DXing

by Takayuki Inoue Nozaki and Tetsuya Hirahara; 4th edition (1987) (293 pages, 6" x 8", paperbound; \$18 in U.S. funds or 23 IRCs airmail, \$12 or 16 IRCs seamail from Takayuki Inoue, c/o R. Nuevo Mundo, 18-11 Fujimi-cho, Hachioji-shi, Tokyo 192, Japan)

Review by Gayle Van Horn

Rarely does a book come along that gives every serious Latin DXer something to cheer about; such is the case, however, with Nuevo Mundo's LA DXing. Latin listeners will delight in this expanded edition with its improved chapter layout, photo reproduction and quality printing.

The first chapter covers a byfrequency listing of station schedules for Central and South America with notations for active and inactive stations. An additional 65 pages of IDs, sign-on and promotional text in Spanish for Central and South America, Mexico and clandestine stations are included.

New to this edition is an in-depth profile of Mexican broadcasters with studio photos. Full-page DX maps including city and state divisions are provided for Belize, Guatemala, El Salvador, Honduras, Costa Rica, Ecuador, Mexico, and Brazil.

The largest chapter of "LA" is Colombia--a 72-page goldmine profiling 22 stations. Other chapters include a by-country listing of verifications signers, a peek inside Paraguayan radio stations and a look

at the seldom featured country Suriname.

There are also guest features by noted SWL DXers Christian Zettle and Jerry Berg. LA DXing is for every diehard Latin DXer, an informative book which is a welcome addition to my bookshelf.

Security Industry Buyers Guide

(1140 pages, 8-/12" x 11", perfect bound \$90 from Bell Atlantic, 1-800-237-491; nationwide, 1-800-262-2046 Maryland)

This giant compendium is a sourcebook for security related products and services, more than 4500 listings in all. Researched and published cooperatively by the American Society for Industria Security (ASIS) and Bell Atlantic.

The directory is divided into six mair sections: a cross-referenced index turnkey systems, single-function products, consultants and engineers service companies, and company names.

W1FB'S Antenna Notebook

by Doug DeMaw (130 pages, 8-12/" x 11" perfect bound; \$8.00 from the Americar Radio Relay League, 225 Main Street Newington, CT 06111)

Doug DeMaw, W1FB, is well knowr in amateur radio circles for his technical talents, both as former Technical Manager of the ARRL lab as well as for his numerous articles and books on radio-related topics.

Doug's personal choice in experimenting would appear to be antennas. This latest publication is a case in point; it is an excellent essay on practical antenna designs and considerations for HF (1.8-30 MHz) interests.

Written primarily for the ham with transmitting considerations in mind, the practical theory and construction lend themselves to the SWL as well. Dipoles, arrays, verticals, trap antennas, beams, loops - they're all here and discussed in conversational style with an absolute minimum of theory.

A separate chapter on receiving antennas concentrates primarily on applications in the 160-80 meter bands, but the notes are useful for higher frequency assignments as well.

The book is well illustrated and includes examples of tuners, power measurement, a noise bridge, and other test techniques. Very informative, and the price is right.



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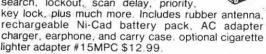
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frequency for each channel is programmed through the numbered keyboard similar to the one used on a telephone. A "beep" acknowledges contact each time a key is touched. The Z30 scans approximately 15 channels per second.

Any combination of two to thirty channels can be scanned automatically, or the unit can be set on manual for continuous monitoring of any one channel. In addition, the search function

locates unknown frequencies within a band.

Other features include scan delay, priority and a bright/dim switch to control the brightness of the 9-digit Vacuum-Fluorescent display. The Z30 can be operated on either 120 VAC or 12 VDC. Includes one year warranty from Regency Electronics (optional 3 yr extended warranty only \$39.99, gives you a total of 4 yrs complete warranty or 2 yr extended warranty only \$29.99, gives you a total of 3 yrs complete warranty.) Z-30 Service Manual \$5.00.



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Digital Programmable 20 Channel Hand-

Digital Programmable 20 Channel Hand-Held Scanner with raised button keyboard for easy programming of the following frequency ranges: 118-136 MHz, 138-174 MHz, 406-512 MHz, 800-950 MHz (NOTE: This is the only hand-held portable scanner which will receive the 800-950 MHz range plus high band, air, and UHF). Features include priority, scan delay, memory backup, dual scan speed, channel lockout, jacks for external antenna and earphone. 90 day factory warranty. keyboard lockswitch, FM mode, search or scan, size is 3" x 7" x 1½". Complete HX2200 package includes Ni-Cad rechargeable batteries, wall charger adapter, protective carry case, and rubber antenna. All for the low price of only \$172.99 plus \$7.00 shipping each. (Optional extended warranty: 3 years \$39.99, or 2 years \$29.99)

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Bearcat

BC-600 XLT

\$224.99 (\$7.00 shipping)

Digital Programmable 100 Channel Scanner

Digital Programmable 100 Channel Scanner BC-600 XLT covers the following frequencies: 29-54 MHz. 118-174 MHz, 406-512 MHz. Features compact size of 6-5-16 "Wx1-5 8"Hx7-3/8"D. scan delay, priority, memory backup, channel lockout, bank scanning, key lock, AC/DC power cords, telescopic antenna, mounting bracket supplied, one year factory warranty, search, direct channel access, track tuning, service search including preprogrammed frequencies by pushing a single button for police fire/emergency, aircraft, weather, and marine services. Plus exclusive optional features never available on any scanner before. First is an RF receive amplifier for boosting weak signals for only \$24.99 plus a CTCSS tone board is available for only \$59.99 to make this the number one scanner available in the USA. Optional cigarette lighter plug #600MPC \$4.99

REGENCY HX1500

Digital programmable 55 channel hand-held scanner. Frequency coverage 29-54 MHz, 118-174 MHz, 406-420 MHz, 440-512 MHz. Covers Public Service bands plus aircraft, trains, marine, plus many others. Has priority, search, lockout, scan, banks, sealed rubber keyboard. 90 day factory warranty. Includes flexible rubber antenna, belt clip and earthone. and earpho

\$224.99 (Plus \$7.00 Shipping each) Optional Accessories Available for HX-1500: Call For Price.

REGENCY RH-256 B PROGRAMMABLE TRANSCEIVER

RH-256B Transceiver, 16 channel 12 VDC 2-way Radio fully programmable in transmit and receive mode. Includes built-in CTCSS tones for encode/decode, timeout timer, scan delay, 25 watts transmit power, priority, plus more. Frequency spread as shipped 152.158 MHz and an eaples and instructions of instantation. Special package deal only: \$359.99 (7.75 shipping)

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(*) Add (\$) per scanner, and \$3.00* for all accessories ordered at same time. C.O.D. shipments will be charged an additional \$3.00 per package. Full insurance is included in shipping charges. All orders are shipped by United Parcel Service. Shipping charges are for continental USA only. Outside of continental USA, ask for shipping charge per scanner.

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Scanner World

Starting at the Beginning



Shortwave -Radio's window on the world

Try to remember back to the first time you turned on a shortwave radio. For most people, the thing that immediately comes to mind is the unbelievable thrill of hearing radio stations from tens of thousands of miles away. Most of us can even, to this day, remember the name of that first station. And most of us still get a little tingle of excitement when we think about it. That feeling stays with us. What's harder to remember is the confusion.

It doesn't take long after we've heard that first station to realize that we are indeed in a strange land. Weird terms like *UTC*, "S" units, propagation, wavelength and meter bands whiz past our heads like bullets on a battlefield. Each and every concept is literally dizzying!

For some people, the experience ends there. Overwhelmed, they run of their local AM and FM radio foxhole -- never to poke their heads into the line of fire again. For these timid souls, the door to an entire world of fun, knowledge and excitement, is closed.

Missing the Thrill

These people won't ever have the thrill of tuning into a government radio station during a bloody coup d'etat and hearing messages designed to calm the local population. "All residents are advised to remain in their houses until further notice," it might say. "There is no reason for panic. The New People's Provisional Government is now in control of all army barracks, federal buildings and...."

They won't have the chance to tune in a marine distress channel to hear the S.O.S. of a Liberian oil tanker under fire in the Persian Gulf. Or gain that incredible insight into world affairs that listening to news bulletins from around the world provides.

And what non-shortwave listener has ever had the opportunity to pick up the telephone and talk live, on the air, to the Queen of England, the U.S. Secretary of Defense or the head of Red Cross famine relief efforts in Ethiopia?

All these things are possible for the person who takes the time and who makes the effort to *learn* about shortwave radio.

Getting By

Sure, cynics will say, you don't need to know about solar flux levels and grayline DXing to hear shortwave. With today's high technology, they chide, a person only needs to know how to flip the "on" switch of their radio and spin the tuning dial to hear the world. And sure enough, that's true -- to a point. But in order to get the *most* out of your shortwave radio, you need to know more than the difference between "on and "off." It's kind of like saying that in order to drive a car from New York to California, all you have to know is how to work the ignition.

The same holds true with shortwave. There are, as Harry Helms says in his Shortwave Listening Handbook, "Many things that happen to a radio signal in the interval (measured in millionths of a second) between when it leaves a transmitter and when it is received by you." Exactly what happens to that signal, how, when and why, is the cause of much frustration. And frustration is short-

Killer Frustration

Take, for example, a first-time reader of *Monitoring Times*. He or she is going to leaf through the pages of this magazine and see some pretty exciting stuff. Maybe they'll read that someone has heard the Burmese Army Station on its new frequency of 6570 kHz. Burma! Wow! And they even have an army!

The reader sits down at noon time, perhaps during lunch, and dials it up. And all they hear is static. Their first idea is to question the integrity of the person who said that they heard it. The second is to curse the editor -that darned fool! The third is to wonder if, perhaps, maybe their radio isn't good enough. And the fourth is usually to give up, disgusted.

If only they had more information. Fella! You just aren't going to hear a

station on that frequency, at that time, operating from that part of the world. It is just about as likely as your getting struck by lightning on your birthday as you cash in your winning four million dollar lottery ticket.

You Need Info

What you need is information. Basic information. A good, fairly reliable rule of thumb. And here's one of them. Frequencies below 10,000 kHz are best heard at night; frequencies above 10,000 kHz are best heard during the day. Those in the middle of the range can be heard both during the day and at night. So while you may get hit by lightning on your birthday as you cash in that winning lottery ticket on 6570 kHz at high noon, the odds are not good.

Too, a \$1,000 communications receiver isn't going to get you those rare stations. What a \$1,000 communications receiver does get you is the proper tools to work with. But if you don't know how to use those tools, then a \$1,000.00 radio is not a whole heck of a lot better than a \$100.00 radio. The fact is that not a small portion of the so-called "experts" in this field use radios most of the rest of us would be embarrassed to admit owning. They just know how to use them well.

An antenna. That's the answer! If I could just attach a three mile-long piece of wire to my Sony ICF-2010, then I'd hear those faint ones. Wrong again. Put a big antenna on something like a '2010 and you'll hear stations all right. It'll be like putting a copy of the frequency section of Passport to World Band Radio in a blender. You'll probably hear all of them where they're supposed to be -- including your local AM stations in the middle of the shortwave bands. However, put that same antenna on a radio that's built to handle it and the results can be stupendous.

And What's That?

And what's all this stuff I hear about "utility" stations? Just what are all those beeping and whirring noises I hear between the broadcasts stations? Do I have to buy a soldering iron to listen to shortwave? Will I be any less of a human being if I don't collect QSL cards? Why are so many shortwave listeners also hams? And just who the heck is Tom Meyer and why do shortwave listeners like him so much?

Each month, we'll try to take you on a trip to a different part of the communications monitoring hobby. Sometimes we'll take a partic topic and beat it to death. Somet we'll answer your letters. And so times we'll invite experts in var fields to be guest writers for column.

Whatever the case, it is our goaget you started -- and started r. And as always, your input it alwelcome. Address your question comments to "Getting Started," Monitoring Times, P.O. Box Brasstown, NC 28902. Personal replies are not always possible, we'll try to answer as many possible within these pages.

Basic Terms for the Communications Monit

Shortwave. Formally, the range frequencies between 1600 and 30,000 k (1.6-30 MHz). Often used, inaccurately the general public to describe "ham" amateur radio.

World Band Radio. A new, modern and descriptive name for she wave radio. Used variously to describe entire range of shortwave frequencies a to describe those portions of the she wave spectrum on which international a domestic broadcast stations are found

Shortwave Listener (Abbreviate "SWL"). A person who listens to transmisions, of various types, on the "shortwave portion of the radio spectrum. The tecan also be used to denote a person we listens to shortwave broadcasts for a content of the programs (as one woull listen to local radio).

Utilities and Utilities Listen (Both abbreviated "Utes"). Two-w communications and those who like listen to them.

World Band Listener. See "Sho wave Listener."

DX (Pronounced: DEE ecks). An of telegraph abbreviation for "distance Refers to unusual and hard-to-he stations.

stations.

DXer (Pronounced: dee ECKS er). person who seeks out of the ordina stations. The term is used to indicate person who monitors various communications, including but not limited to, sho wave, AM, FM, and TV, for the express purpose of hearing as many different at unusual stations as possible. The actracontent of the transmissions is often little or no concern to the DXer. However, a DXer may also be a shortwave listen and vice versa.

Shortwave Radio. A colloquialis generally used to denote any radio th can tune to any portion of the shortwar frequency range. A shortwave radio malso receive AM, FM, etc.

World Band Radio. See "Shortway Radio."

Communications Receiver. A rad designed to receive signals in more that one portion of the frequency spectrul usually shortwave plus AM and often low wave (150 to 540 kHz). This name usually applied to higher-priced mode and often only to the larger table-to models as opposed to portables.

Worldwide Time Table

Confused by time zones? Rene Borde of Sunnyvale, California, shares with fellow MT readers this month his neat scheme to keep track of worldwide time. Centered on Easter Standard Time, the chart below is easily converted to your time zone by adding an hour or so.

To use the chart, simply look up the country of interest and add the number of hours shown (or subtract if a negative is shown). It's that simple. Thanks, Rene, for a helpful time saver!

Icom R70 "Buzz" Cure

My Icom ICR-70 developed a low level electrical buzz. I noticed that when operating it on a metal picnic table, a mechanical hum had also developed in it. Tightening up the two screws that held the transformer in place to the chassis seems to have cured the problem. (David Woo)

PRO32 Scan Speed Increase Revisited

In our October column we reported Tom McElvy's discovery that the scan rate of the Radio Shack PRO-32 handheld scanner could be increased by replacing a resistor. A call from another reader, Frank Loyke, revealed that there are some side effects of the operation.

First, although the resistor value was correctly identified by value (39k ohms), but not by callout; it should be R50, not R51. Secondly, after the modification, the user can no longer lock out channel banks 1, 4, 7, or 10; it may be possible that individual channels within those banks might still be laboriously locked out one at a time, however.

Thus, while the scan rate is approximately doubled by the exercise, there is a negative tradeoff which must be considered before proceeding with the modification.

We appreciate these hints from Tom and Frank and invite other readers with helpful hints for better reception to send in their tips to share with other MT readers.

	1	r
Country	EST	
Country Algeria	Time 6	ŀ
American Samoa	-6	ŀ
Andorra	6	H
Argentina	2	-
Aruba	1	1
Ascension Island	5	t
Australia	15	r
Austria	6	t
Bahrain	8	t
Bangladesh	11	1
Belgium	6	1
Belize	-1	T
Benin	6	Г
Bolivia	1	Γ
Brazil	2	
Brunei	13	Ī
Bulgaria	7	
Cameroon	6	
Chile	1	
China,		
People's Rep. of	13	L
Colombia	0	-
Costa Rica	-1	L
Cyprus	7	L
Czechoslovakia	6	_
Denmark	6	-
Ecuador	0	-
Egypt	7	-
El Salvador	-1	-
Ethiopia	8	-
Fiji	17	-
Finland	7	-
France	6	L
French Antilles	1	L
French Guiana	2	
French Polynesia	-5	L
Gabon	6	L
Gambia	5	L
German Dem. Rep	6	-
Germany,		
Fed. Rep. of	6	H
Gibraltar Greece	6	+
Guadeloupe	1	+
Guam	15	+
Guantanamo Rav	10	+
Guantanamo Bay (U.S. Naval Base)	0	
Guatemala	-1	r
Guyana	2	1
Haiti	0	-
Honduras	1	T
Hong Kong	13	T
Hungary	6	T
Iceland	5	T
India	101/2	T
Indonesia	12	T
Iran	81/2	T
Ireland	5	r
Israel	7	T
Italy	- 6	r
Ivory Coast	5	T
Japan	14	T
Jordan	7	T
Kenya	8	T
Korea, Rep. of	14	T
Kuwait	8	T
	-	

Country	Time	
Lesotho	-	
	7	-
Liberia	5	-
Libya	7	-
Liechtenstein	6	-
Luxembourg	6	-
Macao	13	_
Malawi	7	_
Malaysia	13	_
Monaco	6	_
Morocco	5	_
Namibia	7	
Netherlands	6	
Netherlands Antilles	1	2
New Caledonia	16	
New Zealand	17	
Nicaragua	-1	-
Nigeria	6	-
Norway	6	-
Oman	9	
Pakistan	10	•
Panama	0	•
Papua New Guinea	15	-
Paraguay	1	•
Peru	0	•
Philippines	13	-
Poland	6	•
Portugal	5	•
Qatar		-
Romania	9	•
Saipan	15	•
San Marino	6	•
Saudi Arabia	8	-
Senegal	5	
Singapore	13	
South Africa	7	-
Spain	6	-
Sri Lanka	101/2	-
St. Pierre and	10/2	
Miquelon	2	
Suriname	11/2	
Swaziland	7	
Sweden	6	-
Switzerland	6	
Taiwan	13	
		•

Tanzania	- 8	
Thailand	12	•
Togo	5	
Tunisia	6	
Turkey	8	
Uganda 7	8	
United Arab Emirates	9	
United Kingdom	5	
Uruguay	2	
Vatican City	6	
Venezuela	1	•
Yemen Arab Republic	8	
Yugoslavia	6	
Zaire	6	
Zambia	7	
7imhahwe	7	Ī

Caribbean/	1	Anguilla, British Virgin Islands, Union Island
Atlantic	1	Antigua, Barbados, Bequia, Dominica, Montserrat, Mustique, Nevis, Palm Island, St. Kitts, St. Lucia, St. Vincent, Trinidad, Tobago
	0	Bahamas
	1	Bermuda
	0	Cayman Islands, Dominican Republic
	. 0	Jamaica



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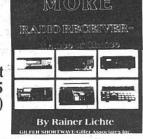
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Antenna Matching: An introduction

If we take our communications seriously -- and many of us do -- we will naturally notice factors which seem to be important in producing good contacts when conditions are difficult. Sooner or later, most seasoned operators come to the conclusion that the effectiveness of a radio station's antenna system one of the most important factors to consider when operating under less than optimum conditions.

But acquiring a good antenna and mounting it high and in the clear is not necessarily enough to insure good communications. For instance, it is quite possible to have a high gain antenna which performs poorly due to inefficient matching of the antenna to its feedline, or of the feedline to the rig (transmitter, transceiver, or receiver, see fig. one). Obviously then, an appreciation of the importance of matching is a prerequisite for setting up a good good radio system. So this month we'll consider just what matching does for us, and some ways in which it is accomplished.

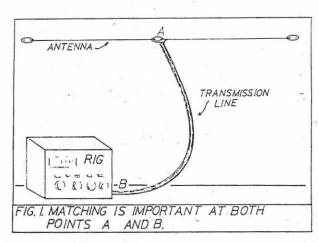
Got a Match, Buddy?

Just what is matching, anyway? For our purposes, we can answer this question by saying that matching is that situation in which the electrical characteristics of two circuits are such that the most efficient transfer of power possible can take place from one circuit to the other. The circuits that we will consider matching to one another will be your antenna, your feedlines, and the antenna input/output circuit of your receiver or transmitter.

The electrical characteristics referred to in the above paragraph are the impedance of the feedpoint on the antenna, the impedance of the transmission line, and the impedance of the antenna circuit within the radio receiver or transmitter. Nicely enough, we don't actually have to understand impedance in order to understand matching. We just have to accept the idea that power transfer is optimum when each of two circuits connected together have the same value of impedance.

Thus, when the impedance of a feedline, such as RG-58(52 ohms impedance), is approximately the same as the impedance of the feedpoint of some antenna (like the approximately 50 ohms feedpoint on a drooping-radial groundplane antenna) there can be an optimum transfer of power between these two circuits(feedline and antenna).

So, when you are receiving a signal, matching your antenna to your feedline allows you to get maximum signal transfer from your antenna into your feedline And matching your feedline to your receiver's antenna input circuit lets you get the maximum amount of that signal from your feedline on into your receiver. When trans-



mitting, matching lets you get maximum signal transfer what received power we have on down the line into our receiver (or our transmitter's power on out to our antenna) the better job of communicating we can do.

The Best Things in Life are Free

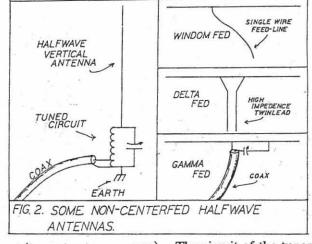
Sometimes matching between an antenna and feedline is taken care of "automatically". That is popular feedline impedances are available that are the appropriate value to match the impedance of some popular antennas. The example groundplane and RG-58, given above, an "automatic match". Again, RG-59 coaxial cable has an impedance of about 75 ohms, which is a good "automatic" match for the 75-or-so ohm impedance of the center feedpoint of a halfwave dipole antenna. TV twintransmission line has impedance of about 300 ohms, which matches the approximately 300 ohm feedpoint impedance of a foldeddipole very nicely.

But the feed point impedance on many antennas, particularly beams, often cannot be matched by standard feedlines. In such situations we must do something so that we have a reasonably close match of the impedances involved.

Techniques for Changing Impedances

There are a number of techniques at our disposal for changing the impedance of the feedpoint of an antenna, or of the antenna input/output circuit of a receiver/ transmitter. Changes in antenna input or output circuit are usually accomplished by use of antenna-circuit tuning controls on the rig itself. To change the impedance of the feedpoint of an antenna, perhaps the simplest way to do this is to change the point on the antenna at which the feedline is attached.

A good example and discussion of this technique appeared in Caron's article on the Windom antenna in the August 1987 issue of Monitoring Times. Caron pointed out that the impedance of a halfway dipole varies



from very low value at its center to a very high value either end. Thus we can efficiently center-feed this antenna with low impedance source, or endfeed it with a high impedance source. intermediate between the **Points** either center and end yield intermediate values of feedpoint impedance.

The halfway vertical antenna of figure 2A shows a high impedance end-fed system. The impedance encouraged in connecting to this coil varies from very low at the grounded end, to very high at the top end. Notice that one end of the antenna (high impedance) is attached to a high impedance point on the coil. The coaxial feedline (low impedance) is attached to a low impedance on the

Therefore there is efficient transfer power between the antenna and the tuned circuit. Power will pass efficiently through the tuned-circuit between the antenna and feedline because both antenna and feedline are each matched to their appropriate impedance.

Figure 2B shows the circuits of some other antenna systems which allow matching to various transmission-line impedance values by tapping into a halfway dipole antenna at points other than at its center.

A Baluns of Power!

Radio frequency transformers can be used to match non-equal impedances. The tuned-circuit in the end feed example of figure 2A is actually an autotransformer. There is another type of RF transformer, known as a "balun" which finds frequent application in matching non-equal impedances. For example, a balun transformer with a 4-to-1 matching ratio can be used to match a 300-ohm transmission line and and the 75-ohm center feedpoint on a halfwave dipole (300/75=4/1.)

The Old Standby

The example of matching with which many of are most familiar is the so-called "antenna tuner." An antenna tuner is an electrical circuit which connects between an antenna feedline and the rig with which it is used (this would be at point B in figure

one). The circuit of the tuner is st that it presents an appropri impedance level to both the feedl (actually the whole antenna syste and to the rig. Despite what its na implies, the "antenna tuner" does tune the antenna to the feedline point A, but we can usually live w that if we've used appropriate feedline

Going Further

There is, of course, much me to matching than we can discuss in the column. What I've covered here only an introduction. If you'd like check out more on antenna-feedling matching, check over some of the following references: The Easy Way J. M. Haerle is a very practical boo one of the best you can find; The Rad Amateur's Antenna Hand Book, O and Cowan, is a good practic introduction to antennas.

The ARRL Antenna Boc (American Radio Relay League) ar High Frequency Antennas for a Occasions (Radio Society of Gre. Britain) are both more technical oriented than the first two, but contain much practical information as well.

RADIO RIDDLES

Last Month's Radio Riddl asked: "What is a balun, and wha does it do?" Part of the answer ha been given above. One fact, no mentioned above, is that a balun cabe used to link balanced lines (like Tytwin-lead) to unbalanced lines (like coax), while still preserving electrica balance to ground on the balanced line. The word "bal-un" is derived from the BALunced-to-UNbalanced function of these useful devices.

This Month's Radio Riddle: In radio communications we have occasion to use transmission lines delay lines, halyard lines, Lecher lines load lines, and gray lines. Which of these lines is a phenomenon associated with radio wave propagation, and how does a knowledge of it help us to improve our HF communications? Get a line on the answer to this riddle by reading next month's column. Tithen, Peace, DX, 73

716 N. Roosevelt Loveland, CO 80537



In a departure from the usual, I'm going to chat a bit with you all and skip the boxes and diagrams that usually fill this space in the magazine. I'm going to talk to you about ham radio.

Just about all of the folks here at *Monitoring Times* are ham radio operators. We run an amateur column and we all try to "salt the mine" just a touch in our cooumns. We *enjoy* ham radio and hope we can get some of you interested in giving transmitting a try.

At last count, the amateur population was hitting a median age of fifty (Yours truly is just a couple of years away) and climbing. This is due primarily to the fact that most older amateurs don't give a damn about putting forth any efforts to win converts.

When I got my license back in 1954, there were two hams in town. And one hated kids -- wouldn't give me the time of day (I was 14). The other one was amiable enough to give me my novice test just once. Happily, I aced it.

Today, the amateur population in my neck of the woods is over a hundred. And they don't all work for the electronics industry. Some are nurses, landscapers, and salesmen. Simply put, you don't need a Ph.D. in nuclear physics to get you ham license. Not by any stretch of the imagination. What all of these people have in common is the shared thrill of communicating with other people across the country and around the world.

Now, to the case in point.

Out with the Old ...

In the summer of 1986, a retired, inactive ham visited my home and got the requested demonstration of my radio set up. Well, being something of a perfectionist, my Yaesu FT-101ZD (modified, of course), Dentron MLA-1200 linear amplifier and assorted other goodies were working like the Budweiser wagon team. And this really got him enthused.

In a little while, after knocking off about 15 different countries and learning how they make fermented coconut milk in Pago Pago, he said "what would you want for all this?" I tossed out an outrageous figure, as usual, and after lighting up a cigarette, was astonished to see him writing out a check! If you want a "Chicken today, feathers tomorrow" life, try writing and consulting!

I took the check and helped him out with everything, along with extremely mixed feelings, to say the least. All I had left in the way of amateur gear was some assorted wire.

The cash helped me tough it out until May of this year when I received a little windfall. I'd been wanting to get back on the air but with moving from Evergreen to Loveland and all, it was out of the question. Now I had the chance.

My options were to either purchase someone else's problem that looked like it had been kicked off a bridge or get something new. Full of enthusiasm, I opted for the latter.

... And in with the New

With a fixed sum of money and a little guilt, I decided to start from scratch. I got a Heath HW-9. This is a little QRP (low power 5 watt) rig for CW (code) only. It did have a list of relatively sophisticated features, however. Among them were a crystal filter, an extensive IC circuit, and variable audio selectivity which in the present state of the art works as well as a crystal filter alone.

This unit was covered extensively in the June and August issues of 73 magazine so I wanted to add my personal comments for those who want to get their feet wet with this fine little piece of gear.

Working Out the Bugs

It is a little difficult to construct. I can't recommend it as a first project by any means. I also found that the vernier drive slipped because of a little catch in the variable capacitor. I already knew that from the 73 magazine review. In any case, they make

A Small Tale -Starring the Heath HW-9

those things like aspirin tablets so they can't check every one!

I was also disappointed, but not surprised, by the almost total lack of background noise on 15, 12, and 10 meters. The sensitivity was there to be sure, but at the ragged edge. The HW-9 has no RF (radio frequency amplifier) stage, which really isn't necessary under 30 MHz as extraneous noise masks out just about everything anyway.

Anyway, being intimately acquainted with the 3N211 -- the best dual gate MOSFET for under 50 MHz work, I replaced Q107 (and MFE-131) with it and wasn't a bit surprised as background noise was apparent when switching between a dummy load (a 50 ohm resistor) and the antenna. Q107 is the first mixer in the HW-9.

A little correspondence with Matt Adrian, senior technical service supervisor at Heath, got the problem resolved post-haste. Matt's the kind of guy I like to have working with me -- he's knowledgeable and he cares. There was also a spur (miscellaneous frequencies) on 15 meters that was cured with a new #Q402 (#417-293) that's yours for the asking. Matt states that this will be a new revision, so you got it here first.

Otherwise, with dedicated antennas (resonant for the band in question), I find I can work everything I can hear with no problem at all. (5 watts is just one "S" unit below 100 after all is said and done.)

For a small amount of cash outlay you can join the fun -- and it really is. If you have a good receiver, a QRF transmitter can be constructed for about \$20.00, less power supply. The ARRL Handbook and Bill Orr's publications have a wealth of extremely simple and well-described circuits that may be built from Radic Shack parts. So, if you're tired of listening to owl up da pis (sic) livink peeble uf da worlt, try talking to someone in Iowa or England. It sure is a welcome change of pace.

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72 Channel Yaesu FRG-7700 Memory Expansion

by Don Moman Shortwave Horizons 6815-12 Ave. Edmonton, Alberta CANADA T6K 3J6

The FRG-7700 with the 12 channel memory option installed can easily be rewired to allow 72 channel operation. A total of 256 channels are available; however, a suitable switching arrangement that is convenient to use and implement is difficult to find.

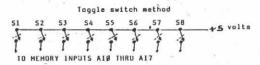
Basics

Refer to diagram PB-2175 (FRG-7700 Memory Unit) and main FRG-7700 diagram. Components Q30-35 are the memory elements. Each IC has eight leads labeled AI0 through A17 that are used to address a certain memory location or channel. These pins are brought out to connector J02 / P34 and finally to the 12 position memory select switch S5a and S5b.

Since we have eight lines, each of which can be in one of two conditions (high or low), we have a total of 2 to the 8th power or 256 combinations available. If we were to install eight SPST toggle switches as shown

below, we could access all 256 memory locations.

This method is inconvenient to use as one can easily see that scanning all the memories would be a chore flicking eight toggle switches and keeping track of them would be a real hassle! Also, there is no way to mount them neatly in the existing front panel space.



A Better Way

In most applications, the front panel ATT (attenuator) control on the 7700 serves very little purpose and can easily be eliminated. In its place we will install a six position memory bank select switch which will allow us to retain the original 12 position memory channel select switch but give us a total of 72 memory channels.

Rewiring the Memory Channel Switch

Some major disassembly is required. The ATT and MEM CH switches must be removed -- this can only be done by removing all the knobs and the front panel. The ATT pot is left in the normal MAX setting end tied back to a convenient spot in the set where it isn't touching anything. The control may be reinstalled should you ever wish to.

The leads on the MEM CH switch are called A0 through A7 on the schematic and you should verify which color is which! They are not all color coded properly! Rewire, following accompanying diagram and steps below.

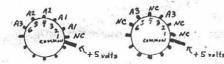
Adding the Memory Bank Select Switch

The first obvious step is to locate a usable switch! It should be a six position, two pole rotary switch capable of mounting in a 1/4 inch hole. Most

switches mount in a 3/8" hole. The panel hole in the 7700 is metric (approx. 5/16") so, unless you wish to enlarge the hole, find a 1/4" switch or order one from Yaesu or from Shortwave Horizons.

I will be attempting to stock the original MEM CH switch from Yaesu for this purpose. It's compact, fits right and blends right in -- even the knob fits in. It is a 12 position two pole switch but you will only need to use the first six positions. If you can find a good use for the other six let us know!

Whichever switch you find, it should be wired as follows (NC = no connection!):



The +5 volts comes via the 6" wire you added to the original switch. There is enough slack in A1, A2 and A3 (when the wire bundle is freed) to

Unusual MW Antenna Booster

Portable AM broadcast band portables are often limited by their tiny internal loop antennas. Efficiently wound around a ferrite rod core, the antenna coils still occupy a very small volume and intercept only small signal voltages.

It is possible, of course, to open up the radio and adapt it to accept a long wire antenna, improving its signal pickup; but wouldn't it be more convenient to utilize some external means to capture more signal voltage?

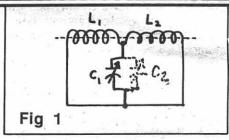
A trick used for decades by medium wave DX enthusiasts is to employ a passive external loop which concentrates the radio field, coupling it inductively to the internal loop antenna rather than requiring a direct connection. Tuned to resonance at the desired frequency, the contrivance becomes a giant RF transformer, improving signal voltages dramatically.

A novel approach to this method was

sent in by reader Malcolm Nichols of Franklin, Tennessee (see figure 1); his design is based on an unusual method developed by the U.S. Army Signal Corps many years ago. The original version was housed in a metal trough which acted as a Faraday shield, assuring that the antenna would be sharply directional in its response.

Malcolm wound his coils on a ferrite rod he obtained from Mouser Electronics (2401 Highway 287 North, Mansfield, TX 76063; part number 542-FR-500-7.50, \$15.56) using 20 gauge, double-silk-covered wire acquired from Fair Radio Sales (PO Box 1105, Lima, OH 45802). Any similar-gauge insulated wire should work

The variable capacitor is rated for at least 365 pF maximum; Malcolm used a dual 410 pF unit with an external switch to engage the second section if required to tune the lower frequencies. Mouser has a usable tuning capacitor, part number 524-

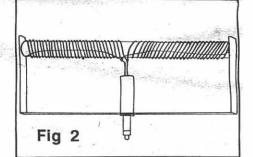


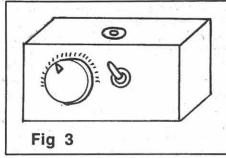
A1-227, for \$10.95. Similar capacitors may be salvaged from old tubetype radios--check a local repair shop; you might get lucky and find a ferrite rod antenna as well!

The coils consist of 53 turns on one and 51 turns on the other to prevent their inductances from cancelling and to provide a balanced loop with constant capacitive reactance along the windings, according to Malcolm.

It is important that the two windings are opposite in phase, so start winding from the middle on each coil as shown in figure 2, going over and then behind the rod on the first turn in each case.

The two far ends of the windings are brought back and connected together as one lead into the phone plug; the common center of the two windings is the other lead. The windings may be taped in place on the ferrite rod or glued if the ferrite has no paraffin coating.





The mounting bracket is made of wood or plastic; metal would distort the pattern and change the inductance. The rod assembly is mounted on a phone plug which, in turn, is inserted into a matching jack mounted on the top of a convenient utility box and connected to the variable capacitor mounted in the same box as shown in figure 3.

To use the tuner, simply bring the portable radio close to the loop and tune the variable capacitor for maximum signal. The loop may be rotated to favor a particular direction or null out interference.

route these wires over to the new itch.

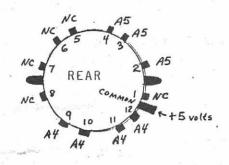
his completes all the modification teps, and upon putting it all back ogether you should have 72 chanels to play with, instead of just 12!

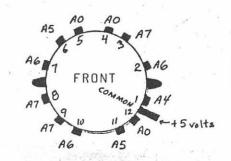
If you are unable or don't wish to perform the modification for the 72 channel memory on your FRG-7700, Shortwave Horizons will modify your set for you. Contact us for further details.

Rewiring Diagram

- (1) REMOVE:A3 (red) A2 (orange) and A1 (yellow) from front deck, lugs 2,3,&4
- ADD :A7 (gray) to #2; A6 (violet) to #3; and A0 (green) to #4 :A5 (blue) to 2,3&4 on rear deck
- ADD
- :6" wire to +5 volts (common of each deck) to be used for new (4) ADD switch

This completes rewiring of the original MEM CH switch. The switch should match the following rear view of switch wafers, as installed, KEYWAY down (front and rear wafers separated for clarity).





Notch Filter for Interference

A recent letter from Jim Coyle of Johnson City, New York, is typical of many we receive here at MT headquarters. Jim is troubled by a strong NOAA weather transmitter located just a few miles away. Signals are so strong that he frequently hears the weather forecasts no matter where he tunes his scanner. Is there a simple cure?

Advising Jim to move is one possibility, but we suspect that it may not be the most practical. He needs technical help now.

Several years ago Grove Enterprises designed their popular Scanner Filter, a tunable notch filter which was connected between an antenna and a scanner. The device could be tuned to remove a single interfering signal between roughly 80 and 220 MHz.

As successful as the product was, component costs rose dramatically and it was discontinued. Fortunately, Grove is actively working on an improved version, the FTR-4, which should be ready in a few months.

The new version is almost entirely automatic; connected between the antenna and the scanner it will pass frequencies of interest to scanner

listeners while selectively removing annoying strong-signal interference. But in the meantime, what is Jim-and others like him-- to do?

What Jim needs is a sharp-selectivity notch filter adjusted to 162.5 MHz. A simple one-pole (single resonant circuit) filter, properly designed, can knock down a signal by as much as 40

Such a notch filter can be made out of a five-inch piece of coax as shown in figure one. Solder a 2-18 pF (approximate) trimmer capacitor between the center conductor and shield at one end and install a Motorola plug (Radio shack 274-711) on the other.

If soldering a Motorola plug onto a piece of coaxial cable sounds abhorent to you, purchase the Radio Shack 12-1312 automotive extension cable and snip off the Motorola plug and five inches of cable. The trimmer may then be soldered across the cut.

If you can't find the trimmer, you may use a Radio Shack 272-1340 (6-50 pF) with a tiny fixed capacitor of approximately 22-47 pF soldered in series with the stator lug. Keep the leads as short as possible.

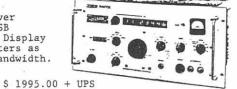
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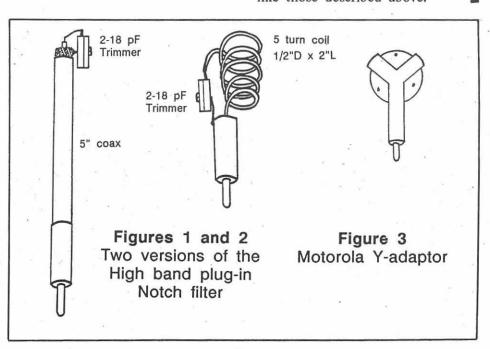
Alternatively to the coax, wind five turns of stiff, insulated hookup wire around a half-inch form; remove it from the form and stretch it to two inches. Insert one end into the Motorola plug and solder it; the other end is connected to one lug (stator) on the trimmer and the other lug (rotor) is soldered to the rear of the plug shell.

If the problem occurs with the screwin whip attached, simply plug the notch filter into the external antenna jack; if an outside antenna is in use, plug the filter and the antenna cable into a Y-adaptor (Radio Shack 12-

1313), then the adaptor into the external antenna jack.

With the interfering frequency tuned in, adjust the trimmer slowly until the signal drops sharply, then tune in desired signal frequencies to make sure that they are still clearly receiv-

Similar notch filters can be made for a variety of applications and frequencies. FM and TV broadcasters, aircraft images on the police band, mobile telephone pilot tones--all wreak havoc with scanner listeners. All can be cured with a notch filter like those described above.



- Q. How can I connect an external antenna to my Regency HX2200 handheld scanner? (Jim Larocque, Phoenix, AZ)
- A. Some scanners don't make it easy, and the threaded hole on your HX2200 is a fine example. A variety of adaptors are available from Centurion International, PO Box 82846, Lincoln, NE 68501-2846. Write to them for pricing, describing your unit and connector you desire.
- Q. Will the Grove Hidden Antenna System give me better 800 MHz reception on my BC800XLT than the whip on my scanner? (Marcus Ard, Georgetown, SC)
- A. Probably, but the Hidden Antenna works best up to about 500 MHz. Since your Bearcat has a separate input for the 800 MHz band, try the following experiment in devising your own antenna length for use with the Grove preamp that comes with the Hidden Antenna System.

Select a piece of coaxial cable long enough to reach where you want to suspend the indoor antenna. Install an F connector on the end which attaches to the preamp; trim back about 4 inches of the black jacket on the far end in order to expose the braid. Peel back the braid, separating it from the insulated center conductor.

Now pull the braid in one direction and the center conductor in the other, forcing it to shape itself into a short vertical dipole. With the scanner listening to an active 800 MHz frequency and the Hidden Antenna System plugged in and working with the homebrew antenna, move the vertical dipole around for best reception and attach it permanently at that spot.

Q. I have a restricted space for an antenna. If I mount the Grove Scanner Beam horizontally instead of vertically, will the performance be degraded significantly? (Peter Dougan, Sarnia, ONT)

- A. In an ideal environment (high above ground, no reflecting surfaces, flat terrain) you would probably lose some 30 dB of signal by changing the mismatching polarization. In the city with its considerable signal reflections it's impossible to predict. Chances are there would still be some loss, though not as profound as if the antenna were in the clear.
- Q. What states outlaw mobile scanners? (William Doherty, Madison, FL)
- A. At last count Indiana, Kentucky, Michigan, Minnesota, New Jersey, New York, North Dakota, and South Dakota all have prohibitions against mobile monitoring of police calls. There are various exemptions, usually for law enforcement personnel and licensed amateur radio operators.
- Q. When I key in frequencies like 167.52 and 165.387 on my scanner the numbers show, but when I attempt to enter them, another frequency will show. How come? (Rod Plyler, Lancaster, SC)
- A. The FCC has different channelization plans for different bands. For example, assignable frequencies in the domestic high band (150.8-162 MHz) are separated by 15 kHz, while those of federal government high band (162-174 MHz) are separated by 25 kHz. To make things even more complicated, channel "splintering" is authorized--167.175 is followed by 167.2125 MHz.

Following all of these changes would be quite a task for a scanner's microprocessor. Some manufacturers compromise by using average increments, saving the expense of an extra digit on the frequency display as well.

When you enter 167.2125 MHz, the display may read 167.215 or 167.210; since the bandwidth of a typical scanner FM signal is about 15 kHz, the 2.5 kHz off-center frequency will never be noticed.

Q. Are there any handheld scanners that have continuous 30-512 MHz frequency coverage? (Patrick D. Shediak, Andrews AFB, MD)

- **A.** No, and as best as we can determine, none is planned in the near future.
- Q. What advantage would there be in using two Grove TUN-3 MiniTuners instead of one between my outdoor antenna and my shortwave receiver?
- A. Absolutely none, either in series or parallel; we just tried it! This question arrived in the mail just as we were preparing to experiment with noise-cancelling concepts using two preselectors connected out of phase on one antenna. That didn't work, either!
- Q. What is the difference between synchronous detection and exalted carrier single sideband? (R. S. Badessa, Canton, MA)
- A. The prime advantage of single sideband is that it occupies less spectrum space than AM, thus causing and receiving less interference. Single sideband signals, unlike AM broadcast signals, are devoid of a carrier; the receiver must be switched to SSB mode which generates its own carrier, thus restoring normal sound when properly fine-tuned.

If we attempt to use an SSB detector on an AM signal which already has a carrier present, the two carriers, if not perfectly aligned, will produce an objectionable "beat note" or "heterodyne" which severely distorts reception.

Exalted carrier single sideband is a tuning technique in which the listener attempts to adjust the receiver as closely as possible to the original carrier frequency to avoid the distortion.

In synchronous detection the receiver samples the original transmitted carrier and automatically locks its own self-generated carrier perfectly in phase, removing the objectionable distortion and requiring no further adjustments.

- Q. When will digital filters be available for general coverage receivers? (Bill Tomkiw, Oakland, CA)
- A. They are already available for special purpose receivers, but sir our present consumer radios cor from Japanese manufacturers where are legend for copying one another, it is unlikely that we were see true digital RF or IF processing in the near future. Reassured, however, that if one of those offshore manufacturers should break with tradition and put out an innovative product, to others will quickly follow.
- **Q.** What is the difference in distance between whip and outdoor antenna?

What distance can I expect to hear with the attachable whip on my scanner as compared to a good outdoor antenna? (Allen Merrett, St. John's, NFLD)

- A. On the average, you should have reliable coverage of 10-20 miles on the attachable whip and at least 50-75 miles on a good outdoor antenna, assuming flat terrain and a clear view of the horizon.
- Q. Can a scanner preamp lifier be used as a TV or FM broadcast signal booster as well?
- A. Absolutely. Check the manufacturer's literature to make sure it will cover the same frequency range that you require (54-216 MHz for channels 2-13, 512-806 MHz for UHF, 88-108 MHz for FM).

While preamplifiers are great for fringe area reception in the deep suburbs or out in the country, they are discouraged for metropolitan dwellers. Nearby strong transmitters can saturate their transistors and produce severe interference from the overload, including desensitization--an actua reduction in signals after the "booster" is added.

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- Q. What is the difference in range between base and hand-held scanners? Is there much difference in sensitivity and thus, listening range, between hand-held and base/mobile scanners? (Allen Merrett, St. John's, NFLD)
- A. None whatsoever. Circuitry is virtually identical, albeit miniature, in the hand-held scanner when compared to the larger desktop and mobile units.
- Q. What frequencies are used for wildlife tracking? (R. Gamache, Westfield, MA)
- A. Wildlife agencies are experiencing growing numbers of illegal poaching incidents in which the hunter uses radio direction finding to home in on radio-tagged animals, often directly to a lair where the hibernating animal is slain. For this reason, officials are understandably reluctant to pub-

lish frequencies used for wildlife telemetry.

If you are in a game management area or near a wildlife refuge, you may hear tell-tale beacons and beeps from low power (10 milliwatt) collars and tags in the 40.66-40.70, 164.4-164.7, 166.7-167.3, and 216-220 MHz bands.

- Q. Will covering the inside cabinet of a scanner with aluminum foil reduce lockup when both scanners are connected to the same antenna via a Y-connector, or if they are side by side using their own whips? (John Mahoney, Pawtucket, RI)
- A. Scanner lockup, characterized by mutual interference from two adjacent scanners which causes the scanning sequence to stop on certain channels as though a signal is being received, occurs when products of the oscillator frequency of one scanner coincide with receive frequencies of another.

Properly applied and grounded to the chassis (make sure that none of the foil touches electronic components or bare wiring), aluminum foil will inhibit oscillator circuit radiation outward through a non-metallic cabinet; however, it will do nothing for the radiation from the antenna circuitry.

Isolation between scanners is required, utilizing splitters or, better yet, separate antennas. On very strong signal channels, lockup may be reduced by entering the frequency 5 kHz high on one scanner and 5 kHz low on the other. For example, if when 154.875 is being received on one scanner it stops the other, enter 154.870 on the first scanner and add 5 kHz to the frequency entered on the other.

- Q. What DX club should I join? (Barry Rader, Fostoria, OH)
- A. I'm afraid that must be a personal choice, as in choosing a car or a receiver. There are dozens of DX clubs, both here and abroad, with various

strengths, weaknesses and specialties. For a list of clubs and their specifics, send \$.50 in mint stamps with your request to the ANARC Publications Manager, P.O. Box 462, Northfield, MN 55057.

- Q. Why do I hear 130 MHz aircraft signals on my scanner when listening to the 152 MHz band? (Randy Hudson, Albemarle, NC)
- A. All modern superheterodyne receivers produce "images"-- repeated signals other than the desirable one to which the listener wants to hear. High quality (more expensive) receivers have circuitry designed to attenuate these phantom signals, but consumer radios generally suffer from compromised performance.

In the case of scanners (depending upon the brand), these images are typically 21.4 MHz (Regency, Fox and Radio Shack) or 21.6-21.7 MHz (Bearcat and Cobra) away from the desired frequency setting, thus accounting for the offset you noticed on your scanner.

Caveat: GRE 800 MHz Gonverter

In our August issue, an article by Larry Wiland reported why GRE, a Tokyo-based firm best known for their manufacture of Radio Shack scanners, had allegedly discontinued their model 8001 800 MHz scanner converter.

According to Wiland, "a friendly female voice" at GRE's U.S. headquarters in Belmont, California, advised him that pressure from the FCC and some "court battles" had resulted in an agreement between GRE and the FCC which allowed GRE to sell off the remainder of their converters in stock.

have been notified Washington Bob correspondent Horvitz that there were substantive errors in the article which needed to be corrected. We quote from his

"There have been no 'court battles' over the application of the Electronic Communications Privacy Act to the sale of any type of electronic device.

"Current regulations provide no basis for the FCC to 'contact' or 'advise' GRE America that under the ECPA they 'could no longer produce or sell' their model '8001 frequency converter, or for the Commission to 'allow' GRE to continue selling the device only on condition that 'a warning label was affixed to each one

"The FCC Field Operations Bureau has no knowledge of any 'compromise burdensome (Wiland's) article. described in According to Spencer Tall, marketmanager of GRE America, GRE's decision to put a disclaimer in each carton--and not a warning label on the device--was entirely volun-

We appreciate Bob Horvitz's incisive reporting and know that the correction will be of interest to our

Program Guide

Thanks for the renewal reminder. MT is great, but I miss the old hobby-type program schedules

for the SWLer. By this I mean, where and when is SWL Digest, DX Party Line, Swiss SW Merry Go Round, Waveguide, Sweden Calling DXers, Media Network, etc.? You would not have to include column after column of Radio Beijing; this listing would take up less than 1/4 page.

Ed Janowski Spicewood, TX

RDF Network?

It would be super if a network of MT-SWL types could collaborate, in the cases of sufficiently interesting signals, in a coordinated listening effort.

The hard (read costly) part would be the instant callup for signals of opportunity, to pass frequency, mode and details, for cross bearings, signal comparisons... but if all were hams, maybe a RTTY network!

> Bill Edwards Houston, TX

(For years I've dreamed of just such an RDF network and it would be licensable to all participants, not just hams. Any interest out there?...Bob)

"New Math" ?

Re MT October '87; page 21; "800 MHz in Roanoke"

You list the 800 channels saying that they are spaced 120 kilohertz apart. Maybe my math is not too good, but shouldn't the intervals be 210 kilohertz? Aside from that bit of trivia, I enjoy Monitoring Times very much.

Gordon H. Hubbard Tucson, AZ

(Right on! Our typing-transposed the first two digits; 210 kilohertz it

Avoiding the Scandalous

I want to voice my concern about the Scanning column on page 24 of the October MT.

Cordless phones have been covered in MT and elsewhere before...BUT - to present this topic in a "voyeur" or "deviate" light can only give the anti-scanner crowd (cellular, land mobile, Tandy, et al) some more ready-made ammo.

Much of the piece was, I'm sure, intended to be taken as tonguein-cheek by Mr. Kay. However, if you quote parts of it out of context, as our foes like to do, it could be very harmful to us. What would you do if you were a state representative or congressman and saw such quotes?

Personally, if I used a Roloc to keep track of my neighbors, would be the best-kept "dirty lit secret" in town.

Ron Smith WA4JN Birmingham, A

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Need service info for t following. I will purchase of pay co cost. Unicom Electronics Pow Supply Model Pc-11R, Tandy 64 Color Computer II Model 26-312 EMP/GTS Manual Mini Mode Model MM-101 (manufactured Elec and Eltec Co. Hong Kong Garrard Turntable Model Lab 95 Johnson Messenger CB Model 32 Apple IIe Pro System Duo-Dis Imagewriter, Printer Monitor Icom Model 735 Ham Transceive Assoc. Modem Mod Loonam Designers for FM30. Indust Mutual Conductance Tube Test Model TV2CU (F.A.A.), fier/Marker Jerrold Model CM-6 (F.A.A.), Signal Generator URA 64A/TS-419, and RCA Video Di Player Model SGT-250.

Mike Adams, Haney Vo-Tec Center, 3016 Highway 77, Panan City, FL 32405 (904)769-2191.

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When complaints from customer continued to cross our desk, we trie to reach Gerry but our correspor dence went unanswered and h telephone had been disconnected Finally, another letter was receive this morning.

Conditions have deteriorated rathe than improved, according to Gerr and he has been forced to clos Radio Plus Electronics. He ha promised that his mountain c unanswered correspondence--alon with checks (none of which has bee cashed) -- will be returned to sender within the next few weeks.

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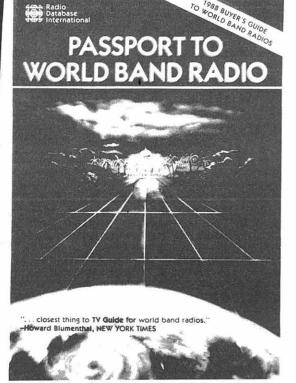
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